



Delimitation and Demarcation of Boundaries in Africa

The User's Guide

African Union Border Programme (AUBP)

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Table of contents

List of acronyms and abbreviations.....	6
Acknowledgements	7
Introduction	8
1 Boundaries: the African perspective	9
1.1 Political context	11
1.2 Boundary-making: a complex process	12
1.3 Objective of this user's guide.....	12
2 Delimitation of boundaries: step-by-step	14
2.1 Preparing for boundary talks	15
2.2 The negotiation process	18
2.3 The drafting of a boundary treaty	20
2.4 The entry into force of a boundary treaty	21
3 Demarcation of boundaries: step-by-step	24
3.1 Overview.....	25
3.2 Preparing for demarcation.....	26
4 Maintenance of boundaries	40
ANNEXES	44
Annex I Diagramme of boundary delimitation and demarcation	45
Annex II Boundary-treaties – reference works	46
Annex III Archives – selection.....	47
Annex IV Maps – additional information	48
Annex V Examples of boundary commissions	52
Annex VI Production of a base map – Cameroon/Nigeria	54
Annex VII Model of a boundary treaty – complete definition	56
Annex VIII Optional provisions for a boundary-delimitation treaty.....	63
Annex IX Political support for the demarcation process.....	70
Annex X Example of joint boundary commission	71
Annex XI Direct labour and material costs	73
Annex XII Example of third-party funding	74
Annex XIII Sensitisation of border communities.....	75
Annex XIV ISO 19100 family.....	78
Annex XV Flow diagram of activities for boundary demarcation – Mozambique	79
Annex XVI Forms used for the demarcation of the Cameroon/Nigeria boundary (pillars and river banks)	80
Annex XVII Boundary Convention – Algeria/Mali	81
Bibliography	82
Resolutions from intergovernmental organisations	82
Books, guides and manuals	82
Statements and conferences	83
Websites	83

List of acronyms and abbreviations

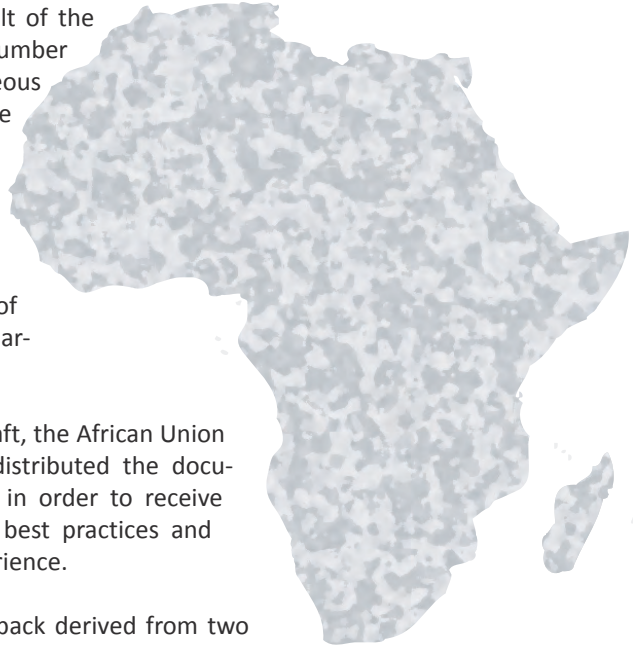
AFREF	African Geodetic Reference Frame
AU	African Union
AUBP	African Union Border Programme
CNMC	Cameroon-Nigeria Mixed Commission
COMGEC-K	Joint Management Committee Concerning the Area of Kourou/ Koalou (Burkina Faso-Benin) (Comité mixte de gestion concertée de la zone de Kourou/Koalou)
CSSDCA	Conference on Security, Stability, Development and Cooperation in Africa
DEM	Digital Elevation Model
EU	European Union
GCP	Ground Control Points
GIS	Geographic Information System
GIZ	German International Cooperation Agency (Deutsche Gesellschaft für Internationale Zusammenarbeit)
GPS	Global Positioning System
ICJ	International Court of Justice
IGRF	International Geomagnetic Reference Field
IMAF	Mozambique National Institute for Maritime and Border Affairs (Instituto Nacional do Mar e Fronteiras)
ISO	International Organisation for Standardisation
ISPRS	International Society for Photogrammetry and Remote Sensing
ITRF	International Terrestrial Reference Frame
LIDAR	Light Detection and Ranging
LNTS	League of Nations Treaty Series
NBC	National Boundary Commission
NOAA	National Oceanic and Atmospheric Administration
NGDC	National Geophysical Data Center
OAU	Organization of African Unity
RIAA	Reports of International Arbitral Awards
SPOT5	System for Earth Observation no. 5
SRTM	Shuttle Radar Topography Mission
UN	United Nations
UNTS	United Nations Treaty Series
UTM	Universal Transverse Mercator
WGS 84	World Geodetic System, 1984

Acknowledgements

This User's Guide is the result of the combined effort by a great number of actors with heterogeneous professional backgrounds. The document was prepared by a team of experts from the African Union Member States with the advisory support of a legal consultant with recognised experience in the field of border delimitation and demarcation.

Upon completion of a first draft, the African Union Border Programme (AUBP) distributed the document to AU Member States in order to receive comprehensive feedback on best practices and lessons learnt from past experience.

This document includes feedback derived from two workshops, held under the overall guidance and leadership of the AUBP. The draft benefited from excellent input from both legal and technical experts working in the field of border delimitation and demarcation in Africa. The User's Guide was validated during the second workshop held in November 2012 in Addis Ababa, Ethiopia, where final editorial comments were received.





1

Introduction

1.1 Boundaries: the African perspective

Colonial heritage: Almost all of today's political map of Africa was drawn in the 19th and early 20th centuries at negotiation tables in various European capitals. As is well known, this endeavour proved only partially successful: even though only relatively few areas were left with no boundary definition at all, in many parts of the African continent demarcation remained deficient and rudimentary by the end of the colonial era. Where demarcation took place under colonial rule, boundary monuments (also identified as pillars, beacons, and markers) may have disappeared many decades or even more than a century ago, leaving no trace at all and ambiguity as to their original location.

Principle of intangibility: As emphasised in the OAU Charter (1963), the territorial integrity of its members was one of the central pillars of the organised community of African States. The First Ordinary Session of the OAU Assembly of Heads of State and Government, held in Cairo in July 1964, accordingly called upon Member States "to respect the borders existing on their achievement of national independence", considering

- ▶ "that border problems constitute a grave and permanent factor of dissention" and
- ▶ "that the borders of African States, on the day of their independence, constitute a tangible reality".

Settlement of disputes by peaceful means in an African framework: In order to cope with the "tangible reality" of the territorial status quo inherited from colonial times, the 1964 OAU-Resolution formulated two more principles of fundamental importance:

- ▶ "the imperious necessity of settling, by peaceful means [...] all disputes between African States"; and
- ▶ the necessity of proceeding hereby "within a strictly African framework".

With respect to boundary-making, these principles were further specified in the **Resolution on Peace and Security in Africa through Negotiated Settlement of Border Conflicts (CM/Res. 1069 (CXLIV))**, adopted by the 44th Ordinary Session of the OAU Council of Ministers (1986). Today, both the respect for boundaries which came into existence upon achievement of independence and the peaceful resolution of conflicts among Member States of the Union, are essential elements of the African international legal order. The Constitutive Act of the African Union (2000) is very clear and unequivocal in this matter.

In the interest of stability and finality, African States are thus called upon to co-operate in a spirit of good faith in their ongoing and future efforts to finalise the definition of their boundaries (delimitation) and to make existing boundary lines visible on the ground (demarcation and reaffirmation). The principle of the sanctity of boundaries inherited from colonial times does not deprive African States of their sovereign right to readjust a boundary line, provided, however, that this occurs by peaceful means and with the consent of all States concerned.

The changing character of boundaries – from barriers to bridges:

One of the principal objectives of the African Union is to “achieve greater unity and solidarity among the African countries and the peoples of Africa” and to “accelerate the political and socio-economic integration of the continent”. Boundary-making must be considered as an integral part of this programmatic vision: eliminating possible boundary uncertainties does not aim to erect barriers between people but rather to lay a solid foundation for bridges between adjacent administrative structures for the benefit of all, and in particular for communities living along both sides of the boundary. Boundary-making is thus not only an essential tool for peace and security, but also for regional integration.

Vision of the African Union – enhancing peaceful, open and prosperous boundaries:

Stable and mutually-agreed boundaries are a major prerequisite for peaceful cooperation among African States. Deficiencies both in delimitation and demarcation have been a recurrent source of tension and conflict between several African States. In order to prevent potential conflicts and to overcome existing conflicts, unanimity must prevail to:

- ▶ ascertain the legal regime governing the boundary at stake and – whenever needed – improve the regime by mutual consent (Delimitation);
- ▶ implement by cooperative effort the provisions describing the course of the boundary line on the ground (demarcation).

At the First Standing Conference on Security, Stability, Development and Cooperation in Africa (CSSDCA – Durban, July 2002) the Assembly of Heads of States and Government recognised the urgent need for action. In 2007, the African Ministers in Charge of Border Issues encouraged the AU Commission to pursue the structural prevention of conflicts. In this context, the **African Union Border Programme (AUBP)** was created in order to

- ▶ assist African governments in delimitating, demarcating, and reaffirming their common boundaries;
- ▶ assist African governments in their efforts to increase regional integration, facilitate cross-border cooperation;
- ▶ develop institutional capacities on a pan-African level.

This mandate was reconfirmed in 2010 and the “Declaration on the African Union Border Programme”, adopted on 17 May 2012 at the Third Conference of African Ministers in Charge of Border Issues, once again underlined the pivotal role of the AUBP in the efforts to enhance delimitation, demarcation, and reaffirmation of boundaries between African States as part of the AU’s commitment to peace and security.

The 2017 deadline: In July 2011, the Assembly of the African Union agreed to do everything possible to successfully complete the delimitation, demarcation, and reaffirmation of African boundaries by the year 2017. The AUBP was assigned a key role in assisting States in their efforts to meet this ambitious deadline.

1.2 Political context

The fixing of precise limits of State territory is much more than a mere legal or technical exercise. With territory being the sounding board for the exercise of State sovereignty, the settlement of boundary-related issues is highly political in character. Creating a favourable political climate – both internally and among States directly concerned – is therefore an essential prerequisite to set in motion a delimitation, demarcation, or reaffirmation process. For a successful outcome, it is likewise important to assure political support in all phases of the process. Once a favourable political environment exists, it is highly desirable to make use of this “window of opportunity” as soon as possible. Boundary-making also affects people, something which should be kept in mind throughout the entire process: sensitisation campaigns can never start too early, as is the case with legal, administrative, and financial tools for possible expropriations and compensations.

Negotiation and mediation: Boundary-making is essentially a matter between neighbouring States. Therefore, it is appropriate that bilateral negotiations be pursued. In some cases, however, third-party mediation with respect to certain aspects of the process may be necessary and advisable. In this respect, preference should be given to regional stakeholders, in particular the African Union or mechanisms provided for by other regional organisations on the African continent. It is only as a very last resort that African States should consider recourse to a judicial settlement (International Court of Justice, International Tribunal for the Law of the Sea or Arbitral Tribunal). The use of these latter mechanisms is costly and time-consuming, and a confrontation in court may ultimately seriously harm inter-State relationships.

General principles governing the boundary-making process: Within the framework of the African Union a number of principles have been identified which should govern the entire boundary-making process: To begin with, while leaving unaltered the principle of the intangibility of boundaries and the duty to settle disputes by peaceful means only, boundary makers should:

- ▶ assure the political backing of their respective governments;
- ▶ be guided by the good neighbour principle;
- ▶ respect the principle of the equality of States;
- ▶ strive for agreement by consensus, which – as matter of principle – implies the readiness to accept a compromise solution.

Adherence to these principles constitutes a good basis for States to reach a comprehensive settlement of disputes or uncertainties regarding the course of their common boundaries and thus to provide an important contribution to peace and security in Africa.

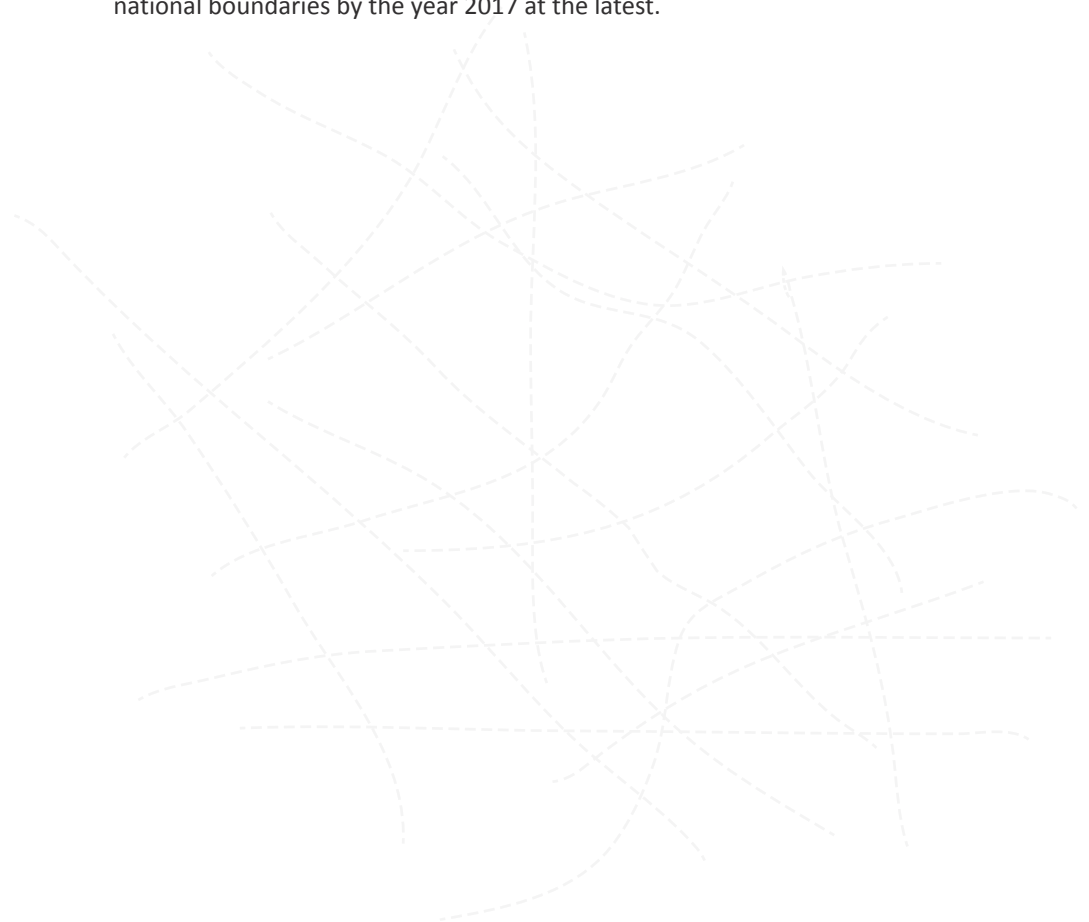
1.3 Boundary-making: a complex process

Boundary-making is a complex time- and resource-consuming process. It results from the combined effort of many actors with heterogeneous professional backgrounds. It involves political decision makers, as well as legal and technical experts. Cooperation based on mutual trust and mutual recognition of each actor's expertise is key to the success of the entire process. This holds true in particular with respect to the indispensable interaction among boundary-making counterparts (*see Annex I – Scheme of Boundary Delimitation and Demarcation*).

1.4 Objective of this user's guide

This guide provides a comprehensive overview of the various steps in the boundary-making process and shares relevant experience made by various African States in the past.

The objective of this guide is to assist African Union Member States in their efforts to complete the delimitation, demarcation, and reaffirmation of their international boundaries by the year 2017 at the latest.







2

Delimitation of boundaries: step-by-step

Delimitation is the legal process by which two sovereign states establish and describe in writing the location of their common boundary, mainly as the result of decision making at the negotiation table.

2.1 Preparing for boundary talks

Preparations at the national level: The decision whether or not, and on what terms, to engage in negotiations on the delimitation of all or part of a boundary with a neighbouring State falls within the exclusive competence of the State's highest political level. Once such a decision has been taken, it is incumbent upon the competent administrative authorities to review the necessary human, financial, and logistical resources for the forthcoming negotiation process and to identify possible shortcomings. Such a review should be executed with the utmost care: adequately skilled and trained personnel as well as sufficient funds are key for a State to successfully advance its positions in bilateral boundary talks and eventually make at least part of those positions acceptable to the counterpart.

Personnel needed to adequately prepare for negotiations include, at minimum:

- ▶ attorneys (specialised in international law, preferably with expertise in boundary issues and/or in drafting international treaties);
- ▶ historians (specialised in colonial history);
- ▶ archivists;
- ▶ cartographers;
- ▶ surveyors;
- ▶ researchers;
- ▶ advisers (from government, military, and other relevant groups).

Funds are needed in order to adequately prepare for negotiations primarily to cover:

- ▶ *per diem* allowances for the staff involved;
- ▶ travel expenses;
- ▶ reproduction costs for legal material, maps, and other relevant documents;
- ▶ technical equipment.

Tasks to be accomplished in preparation for boundary negotiations include, in particular, the comprehensive compilation of evidence such as international treaties, as well as legal, diplomatic, technical, and any other relevant documents.

In some instances the compiled collection of published material may provide sufficient clarity (*for treaty collections see Annex II – Boundary Treaties – Reference Works*). In other cases, archive research remains an essential and indispensable second step in boundary recovery. In view of the overwhelming amount of documents to be located and compiled, archival research requires exhaustive preparation.

Researchers must:

- ▶ exactly define the scope of the anticipated research work;
- ▶ be acquainted with the file classes in which boundary-related records are held in the archive (prior consultation of online and other catalogues is highly recommended);
- ▶ know the details of archive research policies, such as restrictions on numbers of documents consultable per day, permissions required, opening hours/holidays, access to document reproduction facilities and equipment, especially for maps (which may not be available or prove cost-prohibitive);
- ▶ secure professional help from the archival staff. Drawing on their expertise may speed up the research process and facilitate access to materials not readily identifiable in the catalogues;
- ▶ calculate enough time.

Although in most instances European archives are probably still the most informative to researchers (*for relevant archives see Annex III – Archives – Selection*), Member States' national archives also constitute important sources of information. While there is the likelihood of encountering duplicate archival materials, significant documents may be available in only one source.

In particular, map evidence: Maps are essential to any boundary delimitation process and will also almost certainly play an important part in subsequent demarcation. However, when making reference to older maps, one should be particularly aware of the following dangers (*Macdonald: Preparation for Boundary Recovery and Demarcation. In: African Boundary Delimitation and Demarcation 2013, chapter 6*):

- ▶ Magnetic declination – the angle between magnetic north (the direction the north end of a compass needle points) and true north – will have changed significantly, often by a large amount.
- ▶ Positions on the map will often be based on a series of astronomically-fixed survey points. The accuracy of the map will then depend on the care taken with the astronomical observations and the skill of the observer. If the map was created before 1920, significant errors in determining longitude may have occurred;
- ▶ Old maps of the former French colonies may have longitudes based on the Paris Observatory. These will differ by 2° 20' 14" from longitudes based on Greenwich.
- ▶ Contours, when present, will not have been based on a sufficiently dense network of known elevations. If contours appear very rounded in form and the country is mountainous, regard them with great caution.
- ▶ Topographic detail may also be highly generalised and the features associated with the boundary may prove, over time, to be much more convoluted than implied on the original treaty map.

When it comes to applying boundary lines defined by “historical” mapping on the

ground, what is needed, at minimum, is the adaptation of the magnetic declination and a careful examination of whether values of latitude and longitude positions based on astronomical observations are consistent with values, based on a national or global datum (in particular WGS 84), now being used for GPS (*for additional information regarding maps see Annex IV – Maps – Additional Information*).

The National Geophysical Data Center (NOAA) provides valuable tools to determine both historical and present day declinations (using the current International Geomagnetic Reference Field [IGRF])

<http://www.ngdc.noaa.gov/geomag/declination.shtml>

National boundary commissions: At the national level, a boundary commission should be established within a permanent governmental institution to deal with boundaries and to coordinate relevant resources and expertise across government ministries and departments. The composition, structure, and assignment of these bodies feature a great variety (*for examples from African State Practice see Annex V – Examples of Boundary Commissions and for further details consult: Creation and Operation of Boundary Commissions in Africa – The User's Guide*).

Preparations at the bilateral level: When it comes to preparing for the negotiation process, three issues deserve particular attention:

- ▶ States must agree on the establishment of a **joint boundary commission, its composition** and the rules of procedure governing its work.
- ▶ States must agree on **basic parameters** for the negotiation process, in particular regarding its scope and limits and (at least) a rough time schedule.
- ▶ States must agree on **financial responsibilities**.

In particular cases, when only part of the common boundary is at stake, it is most important for States to define **unambiguously** and precisely what sectors of the boundary are to fall under the mandate of the joint commission and which areas – if any – are to be excluded. If applicable, it is further recommended that States determine at a very early stage which sectors of a boundary line need (re-)drawing (delimitation) and which sectors do not require verification of an existing line that is not in dispute between the States (demarcation).

Equal representation of both States and multi-disciplinary composition are common features of all **joint boundary commissions**. However, structures of joint commissions may vary widely: legal and technical experts from various branches of government are certainly an essential component, but official representatives of varied backgrounds, such as justice, foreign affairs, territorial administration, interior, finance, defence, and other relevant authorities, should also be represented. A joint boundary commission is called upon to reach agreement on the alignment of a given boundary – a task which requires legal and technical exper-

tise. It should therefore be self-evident that in selecting members of the commission, the expert element should clearly prevail.

With respect **to financing**, three options exist in order to cover all or a specific portion of the expenses of the delimitation process:

- ▶ the establishment of a **common fund**;
- ▶ the mobilisation of **partner funds** (e.g., United Nations, European Union, GIZ);
- ▶ **individual government funds**.

In many cases, a mixed funding approach will be the most preferable solution. Decisions in this respect should be taken well ahead of the actual initiation of the delimitation process and – where applicable – commitments of financial resources should be included in the budget.

2.2 The negotiation process

The objective of the work of a joint boundary commission established for delimitation purposes is to reach unanimity on the alignment of a specific segment of a boundary line. Therefore it is necessary to reach consensus on certain legal and factual points to constitute the indispensable basis for negotiations:

- ▶ negotiators must agree that the relevant **rules of international law** regarding boundary-making are to be applied;
- ▶ negotiators must agree on a cartographic basis for their deliberations and engage in the common production of a **base map** or the use of orthorectified high resolution satellite imagery.

Whenever necessary, members of the commission from the legal profession should familiarise their colleagues with the **relevant international legal rules** and the pertinent jurisprudence of the International Court of Justice. For example, for the definition of a river boundary, unless otherwise provided, customary law provides for:

- ▶ **Navigable rivers:** The application of the “thalweg principle”, that is, the line drawn to join the lowest points along the entire length of a stream bed in its downward slope, defining its deepest channel (usually coinciding with the fastest flow).
- ▶ **Non-navigable rivers:** The median (or middle) line principle, that is, line equidistance is applied between opposing riverbanks. This principle is highly advisable to avoid future complications resulting from constant changes in a river's course. Likewise, the use of expensive equipment to determine the deepest channel of the river can also be avoided.

It is recommended that during the preparatory period for the boundary delimitation a **base map** should be produced to serve as an important tool during negotiation of the boundary limits. The map should be compiled in digital format using GIS software. At this initial stage of the boundary delimitation, the base map may

be generated as a satellite image map. If necessary, the satellite image map could be transformed later into a topographic map. This same base map can continue to be employed during the entire process of delimitation as well as demarcation and reaffirmation as a working document and finally could serve as a base for the treaty map. Generally speaking, the most appropriate scale of a base map is 1:50,000. However, the most suitable scale may be determined by the boundary commission for every specific boundary (*see for more details Annex VI – Production of a Base Map – Cameroon/Nigeria*).

An **appropriate framework** and **careful planning** are keys to the success of negotiation processes. The commission:

- ▶ must adopt rules of procedure;
- ▶ should establish an agenda and a time schedule before beginning the talks;
- ▶ should agree on the guiding principles of the negotiations;
- ▶ should meet as often as necessary, with session locations rotating between or among the involved States.

Although discussions on the pertinence of certain documents and other related issues may prove contentious, they should always proceed in good faith. An “all-or-nothing approach” will hardly lead to satisfying results: settling differences requires that both sides be willing to make concessions.

The task of a joint boundary commission is to make proposals, not to take final decisions legally binding upon States. At the conclusion of negotiations, the result must therefore be presented to the respective governments for approval or disapproval. There are three possible outcomes of a negotiation process:

- ▶ **Total unanimity:** Drafting of a “*procès-verbal*” to be presented to governments for approval.
- ▶ **Partial agreement:** Drafting of a “*procès-verbal*” on both the points of agreement and disagreement. It is incumbent upon the governments to decide how to proceed with respect to the latter points. After bilateral consultations on the political level, a resumption of negotiations is possible and to be welcomed. For this eventuality, the negotiation infrastructure should be kept intact or at least easily restorable.
- ▶ **Total disagreement:** Negotiations may be resumed at the political level, with consideration of employing other peaceful means of dispute settlement, including the use of third-party mediation (preferable in a regional African context) and – as a last resort – referral to a competent body for a judicial settlement.

2.3 The drafting of a boundary treaty

Once the governments have approved the terms of the delimitation, consensus reached by legal and technical experts on the alignment of the boundary must be shaped into a legal international treaty.

Nomenclature: A treaty is an express agreement under international law entered into by actors in international law, namely sovereign states. A treaty may also be known as an (international) agreement, protocol, covenant, convention, or exchange of letters, among other terms. Regardless of terminology, all of these forms of agreements are, under international law, equally considered treaties and the applicable rules are the same.

A boundary treaty must be precise in its use of words and exact in describing the realities of the terrain. The aims and methods as well as the potentiality to achieve this overall object may, however, differ considerably from case to case. With respect to the detail used to describe a boundary in a treaty, the spectrum extends from an attempt to describe the line so thoroughly that demarcation is merely a matter of routine surveying (complete definition) to a mere definition in principle, which provides the boundary makers in the field a wide margin of application.

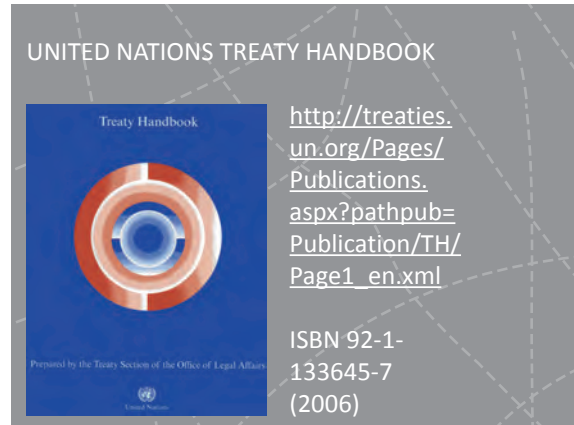
In defining a separation line, boundary makers may make reference to features of very different character and origin, including in particular physical landscape (river, lakes, mountain ranges, watersheds) and geometric lines. At first sight the most simple of all boundary types – and thus very frequently used in boundary treaties – would appear to be meridians of longitude, parallels of latitude, arcs of great and small circles, lines of constant bearing, and lines parallel to or perpendicular to some reference line, but such geometrical boundaries have proven in fact to be extremely susceptible to flaws and errors.

Few statesmen or treaty editors possess the technical knowledge of geodesy surveying to frame a precise definition. Since the earth is neither flat, nor even a perfect sphere, every map of a major portion of the earth contains distortions, which are serious when long geometric lines are drawn. The difference between the earth's shape and a true sphere, though negligible on a small globe, is readily measurable in all geodetic surveying. It follows that no geometric boundary should be delimited without the advice of a geodesist. To draft a complete definition of a boundary in a boundary treaty see the model in *Annex VII – Model of Boundary Treaty – complete definition* and *Annex VIII – Optional Provisions for a Boundary Delimitation Treaty*.

Depending on the circumstances, a boundary treaty itself may be rather brief with detailed descriptions of the boundary contained in Part I and Part II. In any event, much care should be devoted to the drafting of treaty annexes and – in particular – making sure the textual and cartographic components of the treaty conform.

Other reference for drafting a boundary treaty:

boundary treaty: Although designed for multilateral treaties, the United Nations Treaty Handbook likewise contains useful information for bilateral (boundary) treaty making. Prepared by the Treaty Section of the Office of Legal Affairs, it is intended to aid the United Nations' efforts in assisting States in becoming party to the international treaty framework. It is written in simple language and, with the aid of diagrams and step-by-step instructions, touches upon many aspects of treaty law and practice. The UN Treaty Handbook is designed for use by States, international organisations, and other entities. In particular, it is intended to assist States with scarce resources and limited technical proficiency in treaty law and practice to participate fully in the multilateral treaty framework.



2.4 The entry into force of a boundary treaty

Signature: Once finalised, the text of the treaty will be signed by high representatives of both States as mandated by their respective constitutions. The solemn ceremony held at this occasion marks the formal end of the negotiations.

Ratification: This is the procedure that must be fulfilled before a State can assume the international obligations enshrined in the treaty. Ratification usually involves two distinct procedural acts. The first is related to the treaty's compliance with the constitutional (internal) laws of a contracting State. In many instances this involves approval by the national parliament. In other States, consent given by the head of state may be sufficient. The second element deals with the external (international) level. It is the process through which the contracting States indicate to each other their consent to be bound. In the case of (bilateral) boundary treaties, this final act is usually effected through an exchange of the instruments of ratification.

Publication – national level: In general, constitutional law or other legislation provides for international treaties to be published in the State's official journal or gazette, or similar official periodical. The non-fulfilment of this requirement may have the highly undesirable consequence of a treaty being binding under international law but not within the State's internal legal order.

Registration – international level: On the international plane, non-publication does not affect the validity of a treaty as such. However, Article 102 of the United Nations Charter precludes a State from invoking a treaty before organs of the United Nations, including, in particular, the International Court of Justice, un-

Article 102 UN-Charter

- 1 Every treaty and every international agreement entered into by any Member of the United Nations after the present Charter comes into force shall as soon as possible be registered with the Secretariat and published by it.
- 2 No party to any such treaty or international agreement which has not been registered in accordance with the provisions of paragraph 1 of this Article may invoke that treaty or agreement before any organ of the United Nations.

less it is properly registered with the United Nations. Such registration may be effected unilaterally or jointly by States parties to the treaty at stake. It is advisable to register boundary-related documents, even if their treaty character may not be absolutely certain. Although the legal character of a document is not determined by the Secretariat's refusal of, or acceptance for, registration, in practice its assessment has a certain guiding value.

Political decision: The question of "if", "when", and "how" a treaty registration falls within the exclusive purview of governmental authorities on the State's highest political level - in general the Presidency, the Prime Minister's office, or the Foreign Ministry. However, this does not impede com-

petent authorities from other administrative or technical bodies involved in the treaty-making process from becoming involved in the registration process.





3

Demarcation of boundaries: step-by-step

Demarcation is a field operation. Its purpose is to mark the location of the boundary on the ground so it is visible to all. The initial stage normally starts with the surveying. The purpose of demarcation is to place markers or identify physical features that accurately represent the location of a delimited boundary. Wherever possible, demarcation by artificial boundary markers should consist of monuments placed directly on the boundary line. A joint survey team, composed of an equal number of members from each country, normally undertakes the physical demarcation.

3.1 Overview

Making boundaries visible to all: The purpose of demarcation is to improve the definition of a boundary by marking its position on the ground. Demarcation is thus essentially a field operation. However, this operation does not only require intense preparation. Results obtained and information gathered while working on the ground or by other means (such as remote sensing) also need processing and management following the fieldwork. Here are the phases in the demarcation process:

► Preparation phase

- 1 Reach political consensus;
- 2 Establish an appropriate institutional framework;
- 3 Define the mandate of boundary commission and other bodies involved;
- 4 Secure financial, human, and technical resources;
- 5 Training of personnel;
- 6 Plan by the joint boundary commission, including a comprehensive collection of all boundary-related materials; agreement on common standards, and the establishment of a work plan and a timetable;
- 7 Undertake a programme to sensitise the local population.

► Field work

- 1 Perform reconnaissance of the terrain to evaluate working conditions (presence of land mines, camping facilities, security constraints, etc.);
- 2 Identify and agree upon ground control points and geodetic control points;
- 3 Identify and recover existing old boundary markers;
- 4 Rebuild and/or replace destroyed or missing old boundary markers (if located);
- 5 Build new intermediate boundary markers to densify the boundary;
- 6 Survey all boundary markers;
- 7 Perform computations and analysis.

► Base map production

- 1 Conduct pre-marking and observations;
- 2 Compile aerial photography (satellite imagery) and make ground inspections;
- 3 Mark posts and do aerial triangulation;
- 4 Map all features including all infrastructures along boundary lines;
- 5 Prepare and produce boundary map.

► Post-demarcation phase

- 1 Prepare adequate documentation;
- 2 Arrive at a legally binding approval of the fixed line;
- 3 Establish a means to maintain the demarcated boundary line, including in particular a regular joint inspection.

3.2 Preparing for Demarcation

Reaching and maintaining political consensus: Deficiencies of a boundary line may result from:

- an unclear definition of the alignment of the line in the appropriate legal instruments;
- difficulties in applying a given line on the ground;
- obstacles affecting the actual visibility of the line.

In most cases it is a combination of these factors which call for the clarification in demarcating a given boundary. States involved must first agree that deficiencies of this type exist and must also be willing to eliminate them through a common effort (*Annex IX – Political Support for Demarcation Process*). Approval and support by political authorities at the highest level is indispensable at the beginning of the process. Then every effort must be made to maintain the necessary level of political support until, and beyond, the completion of the demarcation. Support may be expressed unilaterally or jointly (e.g. through joint communiqués in summit meetings, at the occasion of ministerial meetings, or even in treaty form). Under special circumstances, a strong, unequivocal and continuous commitment of the international community may also assist the successful completion of a demarcation project (*for African State practice see Annex X – Example of Joint Boundary Commission*).

Creating an institutional framework: Clarity must prevail both with regard to the composition of bodies entrusted with the task of demarcating a boundary and its respective mandate. A model institutional structure for boundary demarcation should consist of the following three levels:



Securing financial resources: Insufficient funding can pose a major obstacle to the peaceful settlement of boundary issues. Although delimitation and/or demarcation activities may be quite expensive, disputes, unrest and – in a worst-case scenario – war-like situations arising from unclear boundaries, are certainly much more so. Money spent on demarcation should be considered well-invested.

Funding must cover all four demarcation phases: preparation, actual field work, base map production, and the post-demarcation. In addition to the regular budget for the development and maintenance of boundary-related resources in personnel and equipment, a special budget must be calculated to apportion to each individual demarcation phase. The actual costs of demarcation are challenging to calculate (*for a rough estimate of direct labour and material costs see Annex XI – Direct labour and material costs (building boundary pillars)*). Factors to be taken into consideration include:

- ▶ characteristics of the terrain;
- ▶ accessibility;
- ▶ weather conditions;
- ▶ potential for a conflict-laden situation on the ground (need of a military escort);
- ▶ risks arising from the presence of wildlife (need for police or ranger protection);
- ▶ need for mine clearance or similar activities in the border area;
- ▶ transportation and materials expenses;
- ▶ labour expenses.

Regarding the administration of financial resources, there are basically three options:

- ▶ direct allocation by each country through its respective institutions of its share of total costs (usually on a parity basis) in favour of a shared account located in one of the two countries (or possibly in a third State) or two separate accounts, one in each country;
- ▶ creation of a jointly-managed fund acquired either from national contributions and/or third parties. Where a third party is involved, they should also assist with resource mobilisation. Cooperation with

international donors should always be considered to solicit voluntary contributions;

- ▶ direct funding from third parties

(see also Annex XII – Example of Third Party Funding).

Personnel training: Relevant skill and expertise among the personnel involved is key to a successful demarcation. On the national and international (bilateral) level personnel must be chosen only on their merits and competencies; members lacking the technical background and expertise may jeopardise the undertaking.

Training is essential before and during the demarcation exercise and in the post-demarcation border management phase. The target group should involve all those in the boundary-making process, in particular:

- ▶ members of (national or bilateral) boundary committees;
- ▶ central government officials and local and regional representatives of the people;
- ▶ members of technical (demarcation) teams;
- ▶ members of security and patrolling units.

Standardised (African Union) core-training curricula for the various target groups should be developed and one or several permanent training institutions (“centres of excellence”) should be created in Africa. Universities may provide an ideal anchorage for such an institutional infrastructure. These institutions could facilitate the joint training of personnel from Member States engaged in the planning stage of a demarcation exercise. As a confidence-building measure, joint training can prove to be very beneficial for personnel assigned to an upcoming demarcation exercise.

Key objectives of personnel training include:

- ▶ develop language skills and familiarity with special terminology (technical and/or juridical);
- ▶ improve map-reading and map-interpretation skills;
- ▶ Provide a basic knowledge of international law relative to boundary-making;
- ▶ ensure an equivalent knowledge base in procedures, methodologies, technical specifications and facility with equipment (software and hardware);
- ▶ enhance knowledge about the historical, geographic (including wildlife) and social backgrounds of the countries;
- ▶ develop management skills, including planning, coordination, and budgeting.

Sharing experience (peer exchange) should be encouraged during training and reciprocal visits should be regularly scheduled by technical teams for this purpose. All of the training offered at the centres of excellence, including standards and procedures, should be agreed upon and documented in writing by both countries.

Legal and technical data collection for recovery of the boundary line:

The purpose of demarcation is to mark the location of the boundary on the ground to make it visible to all and to document the technical operations. To prepare for the exercise, one first has to identify the level of precision with which the boundary was delimited in treaties and other legal instruments and second, one has to verify how clearly it is already marked on the ground. Whereas the latter is essentially a field operation, the recovery of the boundary alignment as determined at the negotiation table and approved by the sovereign will of adjacent States, requires research into the history of the establishment of the boundary. The collection process generally includes both primary and secondary sources.

- ▶ **Primary sources** are documents which originate from governments and other stakeholders directly involved in the boundary-making process. They include not only the final outcome of this process (treaties and annexed documents, in particular maps and lists of coordinates etc.) but in some cases, considerable official correspondence and cartographic material relating to treaty negotiation and subsequent demarcation, maintenance, and management activities.
- ▶ **Secondary sources** cover all material reporting on boundary-making in general or a specific boundary section in particular, without, however, being of official status. This sort of material is not only a highly useful tool to trace primary sources but is usually more easily accessible. Discovery of secondary sources should therefore serve as a starting-point for the recovery of the origins and status quo of the legal regime governing the course of a given boundary.

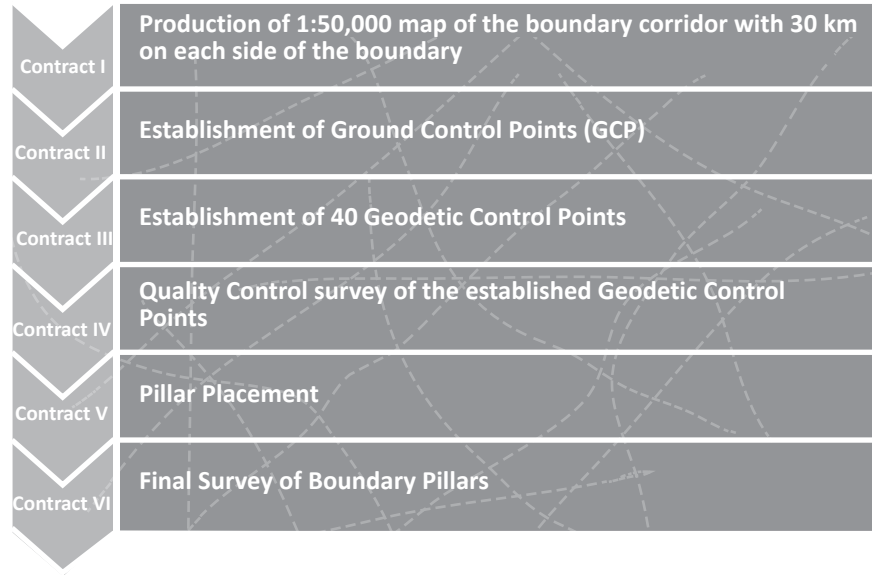
The following items are essential in this respect

- ▶ legal and diplomatic instruments (treaties, agreements and exchange of notes);
- ▶ reports and minutes of boundary commissions;
- ▶ demarcation photographs (aerial and terrestrial);
- ▶ field books and calculation manuals;
- ▶ maps, plans, sketches, and beacon descriptions;
- ▶ official publications on boundaries.

Example from African practice: As both a resource-saving and confidence-building measure, archival research should be made an integral part of the work of the demarcation commission, or another joint body established for this specific purpose. Structures and procedures chosen in order to prepare for the comprehensive demarcation of the boundary between Sudan and South Sudan may serve as a model in this respect.



A coherent working plan and other technical guidelines are important prerequisites for the speedy and cost-effective execution of the fieldwork. The demarcation of the Cameroon/Nigeria boundary provides evidence that a good working plan may allow for the simultaneous execution of field assessment and monumentation in different sections of the boundary. The overall operation of the Sub-Commission on Demarcation followed six specified contracts:



Special attention was paid to Preliminary Mapping
(see Annex VI – Production of a Base Map – Cameroon/Nigeria).

A number of other **technical guidelines**, including, *inter alia*, a consensus on the cartographic projection (UTM zone 32 and 33 for products at 1:50,000 scale – Lambert projection for products at 1:1,000,000 and 1:500,000 scales) and spac-

ing criteria (5 km interval for major pillars – 500 m interval for intermediate pillars – 100 m intervals in populated areas), were intended to facilitate an orderly, clear, efficient, and expeditious survey operation in the field.

It is finally indispensable to have a clear understanding of the final demarcation scheme. Apart from appropriately placed boundary pillars with their associated witness marks and pointer pillars, the Cameroon/Nigeria Mixed Commission agreed on the following documentation:

- ▶ topographic or image maps at scale of 1:50,000 depicting all boundary pillars and the boundary line;
- ▶ one map covering the boundary at a scale of 1:1,000,000 showing the boundary line and pillar positions and including a list of all pillar coordinates on the map sheet;
- ▶ a register listing geographic and UTM coordinates for all pillars;
- ▶ documentation of each pillar site including a diagramme of the pillar and witness markers, pillar coordinates, a pillar photograph showing pillar identification, witness marker coordinates, bearings, and distances to adjacent pillars and distances from pillar to its two pointer pillars;
- ▶ survey reports for the field survey of ground control points (GCPs) for satellite images, datum survey and built survey of boundary pillars. Reports will include coordinates for markers, location diagrammes and photographs of datum markers, field procedures, and personnel involved, computations and checks;
- ▶ a report by the organisation undertaking the datum computations and as-built survey;
- ▶ an independent quality assurance report of the field survey and data processing of the datum surveys and the as-built pillar surveys.

Sensitisation of border communities: In remote and rural areas, the building of monuments (also identified as pillars, beacons, and markers) is often the first time that members of border communities become really aware of the existence and/or the exact course of a boundary line in their immediate neighbourhood. If unprepared, concerns or fears regarding the alleged legal, political, social, and economic implications of these works may spread among villagers and even result in acts of civil unrest. Communication with and provision of information to local stakeholders is of the utmost importance.

Confidence-building measures should start as early as possible - or in any case before the start of the actual demarcation work. This should continue through the demarcation process and extend beyond its completion. Coordinated activities should be pursued, involving the border communities' traditional chiefs and religious leaders as well as the relevant national, regional, and local government agencies. The *ad hoc* bodies (Demarcation Commission and (technical) Sub-Commissions) directly involved in the demarcation process should also be included.

Concrete measures may include:

- ▶ A joint statement by political authorities at the highest level in both States - drafted in clear, understandable terms using local languages, and diffused to the widest possible extent. The key message should be that a boundary is a line separating States not people. On the contrary: Only if you know where the boundary runs, can you bridge it (as noted in the AUBP documentary film "African Borders: From Barriers to Bridges", 2011).
- ▶ A sensitisation campaign (*for examples from African State Practice see Annex XIII – Sensitisation of Border Communities*) on the local level, including small development projects all along the border (if possible of a trans-boundary character).
- ▶ Employment of members of border communities within the framework of the demarcation work.
- ▶ The establishment of a means of communication by anyone potentially affected by the drawing of the boundary line with those involved in its demarcation. Open and transparent communication is the key to the dissipation of distrust and to building the confidence of the local communities in State-sponsored activities along the border.

Field Work: Technical experts are entrusted with the task of implementing the provisions of a boundary treaty by making the agreed line visible on the ground and documenting its exact course. Their task consists of:

- ▶ surveying;
- ▶ monumentation;
- ▶ mapping (including the setting up of technical specifications).

It is important for joint technical experts to collect precise data for a due and proper boundary documentation. This should be done in accordance with internationally recognised quality standards, such as those defined in the ISO 9000 family (organisational specifications) and ISO 19100 family (technical specifications).

In this respect, boundary makers should always give highest priority to the need and scope of understanding of users.

The ISO 19100 is a series of standards for defining, describing, and managing geographic information, i.e., information concerning objects or phenomena that are directly or indirectly associated with a location on the surface of the Earth. This series of standard specifies methods, tools, and services for information management, including the definition, acquisition, analysis, access, presentation, and transfer of such data in digital/electronic form between different users, systems and locations (*for details Annex XIV – ISO 19100 Family*)

ISO 9000 is a family of standards related to quality management systems and designed to help organisations ensure that they meet the needs of customers and other stakeholders.

Establishment of a unified geodetic reference frame for Africa – fully consistent and homogeneous with

the International Terrestrial Reference Frame (ITRF) should have high priority. African States are thus called upon to adhere to the AFREF project (African Geodetic Reference Frame) but until Africa's effort to establish its own national and regional three-dimensional reference networks becomes operational, African States should make use of WGS 84.

The demarcation or reaffirmation of a boundary is a complex operation, which needs careful preparation, diligent execution and a comprehensive processing of data assembled during the field work. Assignments of tasks and responsibilities must be clearly stated and the course of action accurately coordinated (*for African State practice see the flow diagramme developed by the Government of Mozambique, Annex XV – Flow diagramme of activities for boundary demarcation – Mozambique*).

Surveying: Traditional techniques of terrestrial surveying by triangulation, based on the measurement of angles and distances, have since been replaced by modern technology, including Global Positioning Systems (GPS) and Total Stations. In the African context, too, only modern techniques should be used for boundary-making purposes, and appropriate equipment should be made available to the technical teams well ahead of the beginning of the field operation. To avoid difficulties arising from the use of individual national geodetic networks with different reference systems, an internationally recognised system should be used (preferably WGS 84).

Before starting with the actual demarcation work, it may be advisable to dispatch a scouting team, in order to explore the terrain, especially if this is likely to present particular challenges due to critical environmental factors:

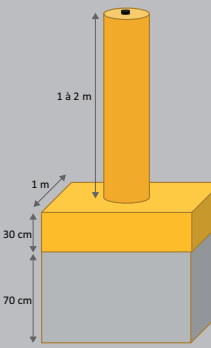


Critical factor	Argument	Effect
Sandy area		
Temperatures above 50°C in peak summer time		
personnel	limited physical well-being	reduced performance
equipment	overheating of engine-driven equipment surveying instruments out of temperature range	reduced performance and shorter maintenance intervals postponing of surveying operations
working materials	fast drying and curing of concrete	reduced progress in monumentation
Sand storms and blowing sand		
personnel	limited visibility and freedom of movement	reduced performance
equipment	increased wear and vulnerability to rust on all mechanics and moving parts	shorter maintenance intervals
Mountainous area		
Occasional frost in winter time		
personnel	limited physical well-being danger of injuring on slippery ground	reduced performance
equipment	limited freedom of movement for vehicle-mounted equipment on slippery ground and on all unpaved traffic lines	work progress on selective sites only
working materials	insufficient curing properties of concrete	postponing of monument concreting
Rain and/or high winds		
personnel	limited freedom of movement and high crash risk on site	work progress on selective sites only
equipment	unfavourable helicopter flying and navigation conditions very high risk of rotor and body contact with ground in hovering-mode at steep slopes (loading/unloading)	work progress on selective sites only
working materials	difficult handling of working materials, that is slippery when wet and uncontrollable movement of all hanging loads at high winds	reduced performance

Mohammed Y. Alsayel, Towards Standardising International Boundary Determination and Quality Control Consequences on Surveying and Mapping (2010), 32

The erection of boundary pillars: Boundary pillars or beacons set at regular distances from each other are probably the most suitable means to make a boundary line visible on the ground. Although it would be desirable in the future to establish a uniform African design for pillars, present day reality is that various forms and types of beacons exist depending on budget and a variety of factors regarding the specific characteristics of the terrain to be demarcated. However, State practice provides evidence of three common features in marking out an international boundary:

- ▶ first, for the marking out of a given boundary, at least two different types of pillars (principal/main and intermediate) are used which differ in size and design. (In the case of Burkina Faso/Mali, there are three types);
- ▶ second, distances between pillars follow certain rules derived from specific realities on the ground;
- ▶ third, the marking out of a boundary generally aims at intervisibility between pillars, although this objective may not always be met due to specific human and/or natural factors.

Boundary pillars (examples):

Burkina Faso – Mali	Mozambique – Malawi – Zambia	
	<p>1. Type “A” boundary beacons:</p> <ol style="list-style-type: none"> Implantation Base of 1.20 m² and 0.40 meters deep. External Bottom Base of 0.70 m². External Height of 1.15 meters and top base of 0.30. <p>N.B.: To build boundary beacons of type “A” may require three (3) bags of cement of Type I, Class 42.5, 15 meters of iron, sand and stone.</p> <p>2. Type “B” boundary beacons:</p> <ol style="list-style-type: none"> Implantation Base of 0.60 m² and 0.40 meters deep. External Height of 0.50 meters with a base and top of 0.30 m². Build a small beacon (Type “B”) under the three steel rails to show the beacon centre and number on all existing boundary beacons built of steel rails. 	
		 

Distance between boundary pillars may also differ considerably due to a variety of factors. However, boundary makers should adopt an approach which is both transparent and understandable (equal distances between the same types of pillars, except for special reasons not to do so). For the purpose of the demarcation of the boundary between Mozambique, Malawi, and Zambia the following general scheme is applied:

	BEACON A	BEACON A (densely populated areas)	BEACON B	BEACON B (densely populated areas/less build areas)
BEACON A	5000 m			
BEACON A (densely populated areas)		1000 m		
BEACON B			1000 m	
BEACON B (densely populated areas/less build areas)				250 m/ 500 m

Reporting and documentation of demarcation work is essential to the work of the Joint Survey Teams. Elements of the boundary report must be agreed upon by the States concerned in as much detail as possible:

- 1 Introductory background
- 2 Mandate and terms of reference
- 3 Composition and rules of procedure
- 4 Meetings and field sessions
- 5 Participation
- 6 Organisation of work – boundary definition, technical aspects regarding the surveying, mapping and physical representation
- 7 Preliminary considerations – including historical background and boundary definition of various delimitation agreements, treaties, etc.
- 8 Mapping:
 - a. Necessity for new mapping – including the definition of methodologies for new mapping of the boundary area
 - b. Field work preparation – including control surveys, definition of datum points to facilitate the production of the maps, control points for definition of primary control network to set out the boundary beacons and photo control points for mapping as well as the aerial photography - specification considerations including scales, pre- and/or post-marking, etc.
 - c. Mapping of the boundary areas – considerations on need for maps, satellite imagery and/or lidar imagery, scale considerations as well as the size and number of map sheets
- 9 Decision on demarcation – including parameters for demarcation, segmentation of boundary lines and accessibility to the boundary sites consideration
- 10 Documentation of demarcation – including the record of all boundary beacons.
- 11 List of coordinates demarcating boundary – including the beacons, inter-visibility of beacons, segmentation of boundary lines, reference systems of the coordinates and ellipsoid associated to it and its elements.
- 12 Annexes – including the list of documents and reports of the Committees, concepts and definitions, rules of procedures and working methods, maps, satellite imagery and processing software.

Data documentation forms should be developed and agreed upon by both sides in the preparation phase of the field operation (*for an example from African State Practice see Annex XVI – Forms used for the demarcation of the boundary – Cameroon/Nigeria boundary (Pillars and river banks)*).

3.3 Demarcation Treaty

Successful boundary-making is a combined effort of persons with very different professional backgrounds, functions and skills: Whereas responsibility for delimitation rests essentially with politicians, diplomats, and (international) lawyers, demarcation is the domain of technicians, including geodesists, surveyors, and cartographers. Once a field survey has taken place and the agreed boundary line has been made visible on the ground, both groups of principal actors in boundary-making have to be brought together to achieve a combined effort in bringing the mission to a successful end:



Material gathered during the field survey and/or through the analysis of aerial/satellite photographs or light detection and ranging (LIDAR) imagery need to be processed; the production of adequate cartographic material certainly being the most challenging and costly task in this respect.

Essential documents regarding the course of the boundary will eventually become an integral part of the demarcation treaty. This so-called “Boundary Documentation” should at least include:

- ▶ description of the state boundary (in tabular form);
- ▶ overview map(s), scales 1:25.000 – 1:250.000;
- ▶ boundary maps(s) (classical of ortho-photo maps), scales 1:1.000 – 1:10.000;
- ▶ catalogue of coordinates (in one common or in two national reference systems).

On the other hand, measurement sketches and protocols are usually not part of the official boundary documentation.

Subject, type, and scope of the boundary demarcation exercise – in particular regarding the boundary documentation – may also be precisely fixed ahead of time in an international instrument (*for an example from African State Practice see Annex XVII – Boundary Convention – Algeria/Mali*).

Binding consent (demarcation treaty): The result of the work of the boundary commission and its sub-organs, as embodied in the boundary documentation, will only have legal effect if made an integral part of a treaty settlement. In this regard, the following may be used:

MODEL CLAUSE

The following Annexes to this Treaty shall form an integral part thereof and, unless otherwise expressly provided, a reference to this Treaty constitutes at the same time a reference to any annexes thereto: [Enumeration of annexes]

The treaty instrument repeatedly emphasises the three-dimensional character of the boundary line as shown in the box below:

ALGERIA - MALI

Convention concerning the demarcation of the State frontier
(with annexes) 1983 (UNTS 1373, 223)

Article 8. The land frontier as defined by the frontier marks under this Convention shall also divide vertically the airspace between the two States as well as rights to the subsoil.

A demarcation treaty must not be treated as a mere administrative arrangement but rather be submitted to the ordinary parliamentary procedures for the approval of international treaties. Ratification procedures in accordance with national constitutional law should be accomplished as soon as possible and followed with registration of the treaty with the United Nations (Art. 112 UN-Charter). If the latter remains undone, a State is barred to invoke the treaty before the organs of the World Organisation, including in particular the International Court of Justice. The need for registration with the United Nations may be recorded in the treaty itself as started in the box below.

ALGERIA - MALI

Convention concerning the demarcation of the State frontier
(with annexes) 1983 (UNTS 1373, 223)

Article 14. This Convention shall be registered with the Secretariat of the United Nations by the Contracting Parties or by either one of those Parties, in accordance with Article 102 of the Charter of the United Nations.

Adequate archival of boundary treaties and the entire boundary documentation is not just crucial for the conservation of evidence. Due to the rather voluminous character of this particular kind of treaty (notably regarding its cartographic components), it also constitutes a logistical and financial challenge. At least three authentic and identical copies, including all annexes, are needed (one for each State and one for the United Nations).



4

Maintenance of boundaries

In order to retain its vital functions for good neighbourly relations between adjacent States, once demarcated, a boundary remains in need of permanent care:

- ▶ boundary management (e.g., regarding water and other cross-boundary natural resources);
- ▶ boundary maintenance (e.g., repair and substitution of boundary pillars);
- ▶ cross-border cooperation.

Boundary markers are exposed to natural and human forces and intervisibility between pillars may disappear over time. Man-made or natural changes in the environment or the requirements of effective local administration and efficient use of resources may even call for minor adjustments of the agreed-upon line. It is important that these issues come to the attention of political authorities before they might grow into a threat for local, national, or even international security.

It is thus important to provide for permanent organisational structures (joint boundary commission) and procedures to conduct ongoing maintenance and survey of the boundary. Provision for these activities should be written into the Demarcation Treaty or if necessary by a later international agreement drawn up for this particular purpose.

Tasks and competences may vary, but the joint maintenance of the physical boundary line should include at least the following:

- ▶ meetings of the Members of the Commission in regular intervals (e.g. once a year) in order to exchange ideas and to discuss boundary-related technical issues;
- ▶ a comprehensive survey of the entire boundary line should be undertaken every 10 years;
- ▶ the right to site inspections whenever a special need arises (including the right to execute any maintenance work);
- ▶ the right to report boundary line inadequacies which may arise and the right to make proposals for their elimination.

The enhancement and facilitation of cross-border cooperation is not only one of the objectives of the African Union Border Programme, but is also a most suitable means to encourage acceptance of the demarcation process. This is even more so when the result of a cooperative project produces immediate and evident benefits for the daily life of local populations on both sides of the border.

Example from African State Practice: In the course of the demarcation process between Mali and Burkina Faso, difficulties arose in the area of two villages, with one belonging to a Malian, the other to a Burkinabe local municipality. Home to the same ethnic group but separated by the border, the area witnessed clashes caused by scarce natural resources. In a common effort by political and administrative bodies on both sides of the border and with the financial support of the GIZ, a small cross-border hospital was built, which included a maternity room, a

pharmacy, a laboratory, and a surgery room. An ambulance was also acquired. It is operated on the basis of the principle of strict non-discrimination – it not only serves the population of both villages, but is also a place where staff from Burkina Faso and Mali work together.







5

Annexes

Annex I

Diagramme of boundary delimitation and demarcation

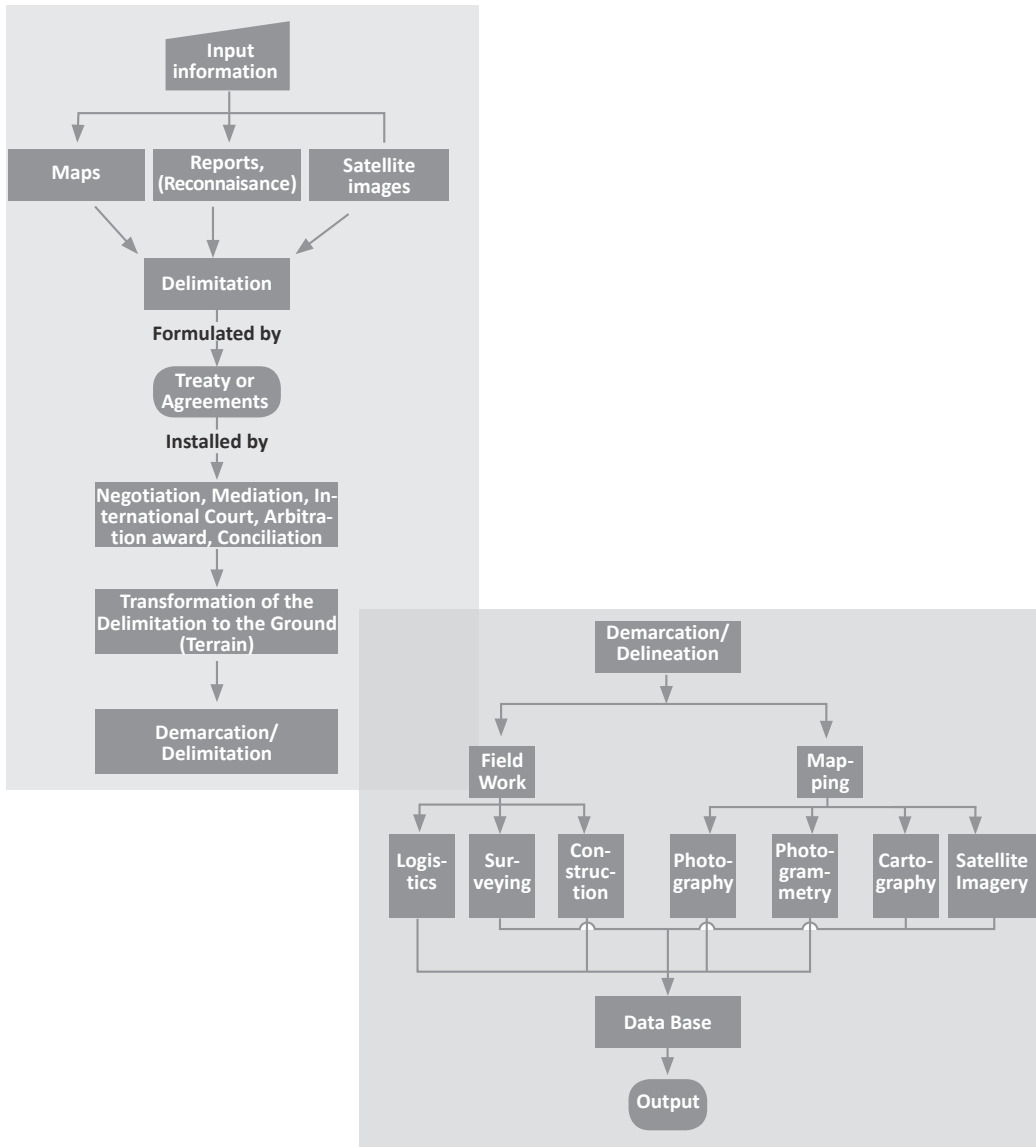


Figure from: M Al Sayel, P Lohmann, C Heipke: International Boundary Making – Three Case Studies (Paper presented at the June 2009 Hannover Workshop of the International Society for Photogrammetry and Remote Sensing (ISPRS)). Adapted for AUBP.

Annex II

Boundary-treaties – reference works

Treaty Collections:

Chronological:

Parry, C: Consolidated Treaty Series (181 volumes)

Period covered: 1648-1918

League of Nations Treaty Series/LNTS (205 volumes)

Period covered: 1919-1945

United Nations Treaty Series/UNTS (at present ca. 2500 volumes)

Period covered: 1945 –

Online (LNTS and UNTS):

<http://www.un.org/Depts/dhl/resguide/spectreat.htm>

Focus on Africa:

Brownlie, I: African Boundaries: A Legal and diplomatic Encyclopedia (1979)

Online (preview only):

<http://books.google.com/books?id=A8Du4k0udx4C&pg>

Hertslet, E: The Map of Africa by Treaty (3 vol. 1909, reprint 1967)

Online (maps only):

<http://hdl.loc.gov/loc.gmd/g8200m.gct00004>

Case Studies:

US Department of State/Office of the Geographer: International Boundary Studies (1960s and 1970s – 87 of the studies relate to African Boundaries)

Online (complete text/ maps):

<http://www.law.fsu.edu/library/collection/LimitsinSeas/numericalibs-template.html>

Annex III

Archives – selection

Relevant archives (a selection)

► Archives Nationales de France

In particular: Les Archives Nationales d'outre mer (Aix-en-Provence)
<http://www.archivesnationales.culture.gouv.fr>

► National Archives of the United Kingdom

<http://www.nationalarchives.gov.uk/records/research-guides/imperial-commonwealth-history.htm> and <http://www.nationalarchives.gov.uk/records/looking-for-place/coloniesanddependencies.htm>

► Arquivo Histórico Ultramarino/ Overseas Historical Archives of Portugal

<http://www.iict.pt/ahu/index.html>

► Germany

Bundesarchiv (Federal Archive):
<http://www.bundesarchiv.de>

Federal Foreign Office (Political Archive):
http://www.auswaertiges-amt.de/EN/AAmt/PolitischesArchiv/Uebersicht_node.html

► Spain

Archivos Españoles:
<http://pares.mcu.es>

► Italy

Archivio Centrale dello Stato:
<http://www.acs.beniculturali.it/>

► Belgium

Ministry of Foreign Affairs, Foreign Trade and Development Cooperation – Africa Archive:
http://diplomatie.belgium.be/en/documentation/archives/sections_and_collections/africa_archive

Annex IV

Maps – additional information

The role of maps in boundary treaties

Nomenclature: A map is a graphic representation of the physical features (natural, artificial, or both) of a part or the whole of the Earth's surface, by means of signs and symbols or photographic imagery, at an established scale, on a specified projection, and with the means of orientation indicated. The drawing of the borderline vis-à-vis other "pictorial representations" of the earth may not always be easy:

Arbital Tribunal India/Pakistan (Rann of Kutch Case) – 1968:

"[Maps presented to the tribunal] are of the most different type, character and scale. Not all deserve the term maps. Some are mere sketches."

(Report of international Arbitral Awards [RIAA] XVII, 83)

The modern use of maps for boundary-making purposes has two very distinct aspects, a technical and a juridical one. Certain technical aspects (e.g. the scale chosen for a specific map), however, may have a direct impact on the legal value of a map and vice versa: a boundary line depicted on a map with a scale of 1:200.000 may certainly not serve as sufficient (exclusive) evidence for the exact alignment of that line on the ground. And if a treaty provides an annexed map to constitute the sole evidence for the alignment of that very line, treaty makers must make sure that the scale of the map is of sufficient accuracy to adequately serve this purpose.

Technical aspects: Maps must meet certain accuracy standards:

- ▶ Horizontal accuracy: For a map compiled photogrammetrically or through satellite imagery, 90% of all prominent features should lie within:
 - ± 0.1 mm of their true locations at the publication scale if the latter is 1/20,000 or larger;
 - 188 ± 0.3 mm of the true locations if the publication scale is smaller than 1/20,000 and;
 - any horizontal control to be used for the compilation of such maps must be accurate to within half the specified map tolerance.
- ▶ Vertical accuracy: of boundary maps should be adequately addressed and subsequently checked and evaluated.
 - 90% of the elevations of all prominent features must be accurate to \pm contour interval of their true vertical position, and
 - Any ground control to be used for the compilation of such maps must be accurate to within \pm of the specified contour interval.

For details: African Boundary Delimitation and Demarcation
Appendix A – Map Accuracy Standards (Abdullah Elsadig Ali)

Maps used for boundary-making purposes must indicate at least:

- their scale;
- the tool used to define the shape and size of the earth, as well as the reference point for the various coordinate systems used in mapping the earth (Geodetic datum);
- date of production;
- map Sheet number (if it is usually part of a larger series of maps);
- map legend;
- publisher;
- (eventually) signatures of boundary commissioners and or political decision-makers.

Legal aspects: Maps play a crucial role in the making and in the recovery of international boundaries. In international courts and tribunals maps of various origins, in very different quality and in great quantity, are regularly presented as evidence to substantiate the existence and (alleged) alignment of a (disputed) boundary line:

EXAMPLE

International Court of Justice (*Maritime Delimitation and Territorial Questions between Qatar and Bahrain, Judgment of 16 March 2001 MN 99*): “In support of its argument, Qatar further relies on a large number of nineteenth- and twentieth-century maps from various countries and from both official and unofficial sources [...]”

Although rich jurisprudence exists on the subject of international judicial bodies demonstrating considerable reluctance to accord probative value to maps, international courts and tribunals nonetheless take immense care in giving probative weight of maps as evidence of boundaries.

For a detailed account of the juridical evaluation of the many maps and charts introduced by the competing parties in the **Burkina Faso and Mali** (International Court of Justice) and **Eritrea and Yemen** (Arbitral Tribunal) see: Prescott/Triggs, *International Frontiers and Boundaries. Law, Politics and Geography* (2008), 198ff.

The leading decision in this respect is the ICJ decision in the Frontier Dispute (Burkina Faso/Mali, 1986):

“Maps merely constitute information which varies in accuracy from case to case; of themselves, and by virtue solely of their existence, they cannot constitute a territorial title, that is, a document endowed by international law with intrinsic legal force for the purpose of establishing territorial rights. Of course, in some cases maps may acquire such legal force, but where this is so the legal force does not arise solely from their intrinsic merits: it is because such maps fall into the category of **physical expressions of the will of the State** or States concerned. This is the case, for example, when maps are **annexed to an official text of which they form an integral part**. Except in this clearly defined case, maps are only extrinsic evidence of varying reliability or unreliability which may be used, along with other evidence of a circumstantial kind, to establish or re-constitute the real facts” (MN 54).

Thus, if States want to make sure that cartographic material will be attributed full probative value for alignment of the boundary delimited and/or demarcated, they have to make them an integral part of the treaty itself. The best way to do so is an explicit clause to this effect in the treaty with a corresponding note on the map:

EXAMPLES

“... shall be annexed to and form a part of this treaty” (USA/Mexico 1970)

“... are indicated on the attached Danish chart No. 92, which constitutes an integral part of this Agreement” (Denmark/Poland 1971)

“... in conformity with the annexed description of the frontier and the annexed map” (Poland/Soviet Union 1951)

Due to the fact that State practice knows of many instances where treaty maps simply got lost over time or it became virtually impossible to decide which one of many maps was the correct one which was once part of the treaty settlement, it is further highly recommended to completely identify the map in the text of the treaty itself:

“... Mere mention of the ‘annexed map’ is insufficient. The ‘annexed map’ may become detached, and reproduced texts often do not include the maps. Identification should include such items as publisher, title, scale, date, and any other features which might be helpful.” (Jones, Handbook on Boundary-Making, 1945, 64)

The legal significance actually attributed to map depictions within a treaty context, however, depends on a number of other factors, among them – in particular – the technical quality of the map and its value vis-à-vis the textual description of the boundary line.

Rather frequent instances of discrepancies between the cartographic and the textual boundary line have created difficult problems. Boundary makers should avoid such errors by carefully cross-checking the various relevant components of the boundary treaty (i.e., textual description – list of coordinates – maps). Boundary makers should further explicitly state whether maps attached to a treaty serve merely “illustrative purposes” or rather have a “defining function”.

ICJ, Frontier Dispute (**Burkina Faso/Mali**, 1986): “The actual weight to be attributed to maps as evidence depends on a range of considerations. Some of these relate to the technical reliability of the maps. ...” (MN 55)

Finally, the treaty should explicitly state whether the map or text prevails in case of a discrepancy:

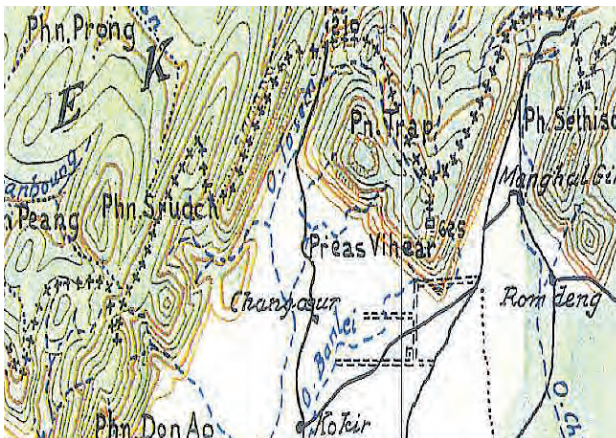
EXAMPLES

Peace Treaty of Versailles (1919): “In the case of any discrepancies between the text of the Treaty and this map or any other map which may be annexed, the text will be final.” (Art. 29 s. 2)

Belgium/United Kingdom regarding East Africa (1926): “Should the description of the frontier given above not agree exactly with the line shown on the map attached to the present Protocol, it is distinctly understood that the Boundary as shown on the map is authoritative.”

Although in the past in the absence of any such explicit clause, the text was presumed to favour the map, but advances in map-making may no longer hold this presumption valid in modern treaties.

In the boundary dispute between Cambodia and Thailand, in 1962 the International Court of Justice was called upon to decide a straightforward conflict between a watershed clause (Treaty between France and Siam, 1904) and a map line, and eventually opted in favour of the latter, thus bringing the Temple of Preah



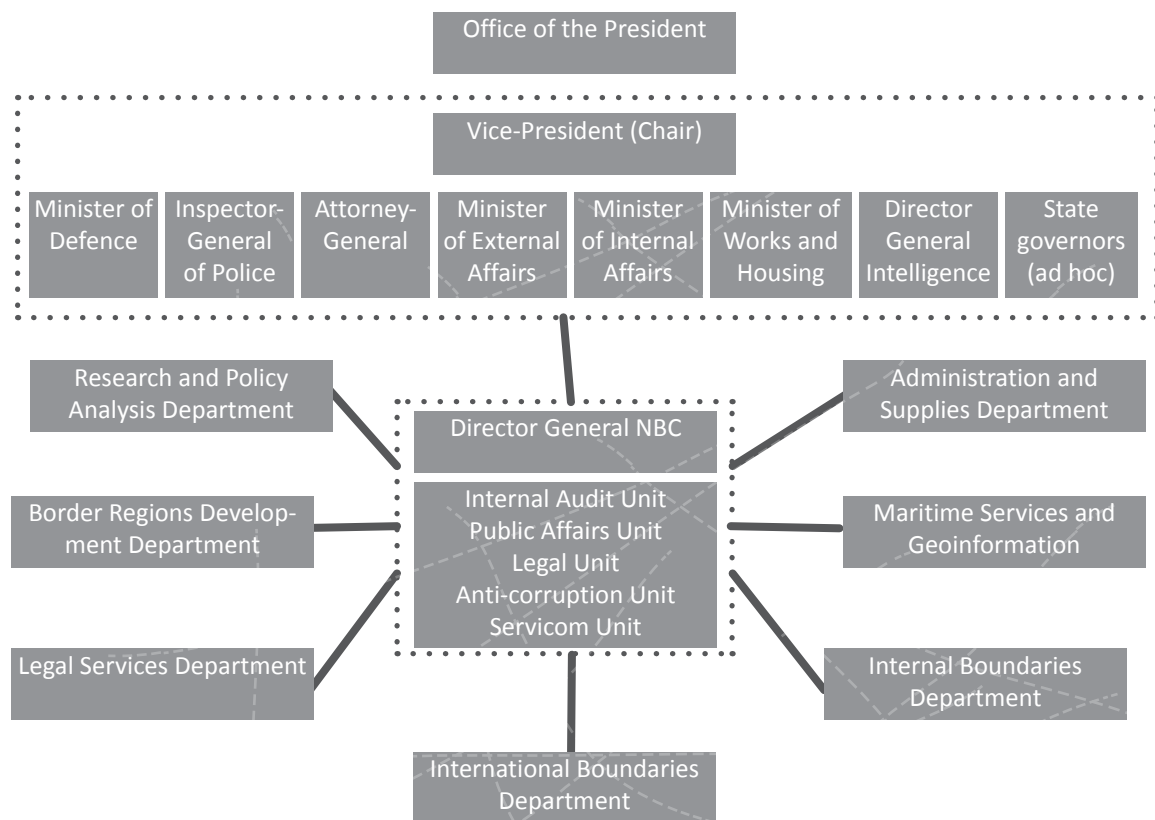
Vihear into Cambodian territory:

“... which caused the map line, in so far as it may have departed from the line of the watershed, to prevail over the relevant clause of the treaty” (ICJ Report 1962, 34).

Annex V

Examples of boundary commissions

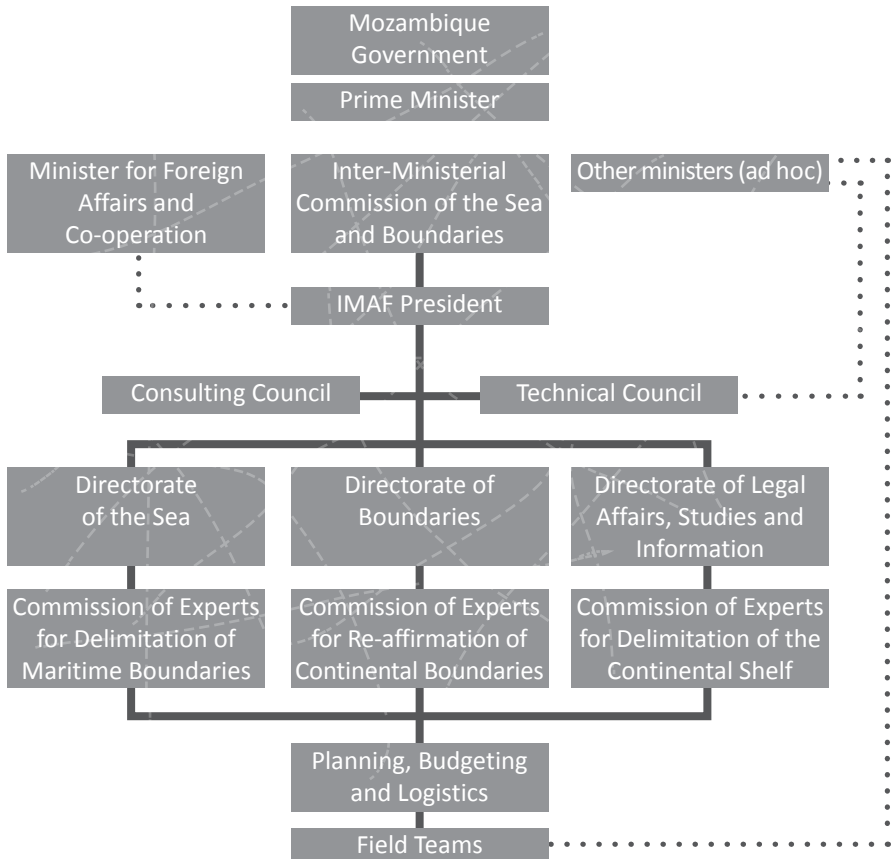
a) Nigerian National Boundary Commission



b) Mali Commission Nationale des Frontières



c) Mozambique – National Institute of the Sea and Boundaries (IMAF)



Annex VI

Production of a base map – Cameroon/Nigeria

For purposes of planning and to provide for initial field reconnaissance of the land boundary, a series consisting of 131 map sheets at a scale of 1:50,000 was prepared from SPOT5 satellite imagery. The task of preparing these maps was relegated by the CNMC to the United Nations Cartographic Section based at the United Nations headquarters in New York.

The SPOT5 satellite images were orthorectified using control points taken from previously orthorectified Landsat satellite imagery. The Digital Elevation Model (DEM) was derived from SRTM (Shuttle Radar Topographic Mission) data in public domain with a 90-metre resolution. The accuracy of the maps produced by this method was more than satisfactory for the needs of field reconnaissance. The greatest difficulty in preparing the preliminary mapping was in finding all the imagery that would be required to cover the entire boundary since cloud cover in the southern reaches interfered with data collection there. As of this writing, satellite imagery covering the entire boundary line itself has been acquired, but some imagery is still missing (that is needed to provide coverage of a full 30 kilometres on each side of the boundary, as agreed upon by the parties).

A provisional boundary line is shown on the maps. Principally, it is a product derived from interpretation of the legal instruments in conjunction with the SPOT5 images. The provisional line serves as a guide to the team in the field. The portions of the boundary line that are defined as watersheds are generated automatically from the SRTM Digital Elevation Model. The coordinates of the provisional line are taken by the JTT into the field where they are then used to actually identify the line.

(Source: Diop/Plante/Rochette in: Communiqué: Association of Canada Land Surveyors, vol. 10 No. 2 at 2)

In selected areas of particular importance, parties agreed on the production of even more precise maps (scale of 1:25,000 based on satellite imagery of 2.5 metres or better resolution). Regarding the production process as such, the parties adopted the following additional parameters and rules:

- ▶ The base maps should cover a corridor approximately 60 kilometres wide with 30 kilometres on each side of the border.
- ▶ All map products should be bilingual: English and French.
- ▶ Datum: WGS84.
- ▶ Survey work will be undertaken by a private contractor selected by and working under the supervision of a Joint Technical Team composed of equal number of members from Cameroon and Nigeria along with United Nations representation.

- ▶ Field Surveying requirements pertaining to primary and secondary control points will be determined by the Joint Technical Team.
- ▶ Cameroon and Nigeria shall appoint in their respective capitals and by the United Nations, a Designated Representative/Focal Points. Nigeria designated the National Boundary Commission as its Focal Point and Cameroon designated Ministry of Justice as its Focal Point.
- ▶ Cameroon and Nigeria shall guarantee free movement and safety of members of the Joint Technical Team and accompanying Persons as well as personnel of any private contractor engaged.
- ▶ Production of the base map(s) will be undertaken by a private team contractor selected and overseen by the Joint Technical with all cost to be covered by Cameroon and Nigeria or any other external funding source(s) that may become available
- ▶ Enhancement of the base map(s) to include a linear depiction of the land boundary as clarified in accordance with the interpretation or application by the ICJ of particular provisions of the instruments delimiting the boundary.



Annex VII

Model of a boundary treaty – complete definition

PREAMBLE

State A and State B,

Desiring to establish a lasting frontier/maintain a discernible frontier between the two States and to settle related issues, and

Wishing to deepen the friendly cooperation between the two States,

Have agreed as follows:

PART I.

COURSE OF THE FRONTIER

Article 1.

(1) The frontier between State A and State B shall run from its point of contact at ... (possibly: specification of the location of a demarcation mark already in existence) with Third State C to its point of contact with the frontier of Third State D at ... (possibly: specification of the location of a demarcation mark already in existence)

Article 2.

(1) The course of the frontier shall be determined as follows:

[detailed description and/or reference to the annexes = boundary documentation]

(2) The annexes referred to in paragraph (1) shall in their totality constitute the boundary documentation for the definition of the course of the frontier between State A and State B.

Article 3.

The frontier shall delimit the territories of the two Contracting States on the ground and also vertically in the airspace and underground. This principle shall also apply to the course of the frontier in relation to surface and underground buildings and installations of any kind.

Article 4.

(1) The frontier shall run as a stable boundary:

(a) Along the straight lines connecting each frontier point indicated by survey data recorded in the boundary documentation to the next such point, and

(b) Along the median line of boundary roads, boundary paths and boundary ditches, as deduced from the boundary documentation.

(2) The boundary roads, boundary paths and boundary ditches shall be described in the boundary documentation. Any modifications to boundary roads, boundary paths or boundary ditches shall have no effect on the course of the frontier, unless otherwise provided by a special agreement between the Contracting States.

Article 5.

(1) In boundary watercourses, [with the exception of river X], the frontier shall be a moving boundary formed by the median line of the boundary watercourses or the main arms thereof.

(2) The median line of a boundary watercourse or its main arm shall be in a smooth, continuous line equidistant from the two shorelines.

(3) The arm of a boundary watercourse with the greatest flow at mean water level shall be considered the main arm.

(4) The water marks, at mean water level, between a boundary watercourse and the adjoining banks shall be considered the shorelines. Where it is not possible to determine the shorelines with certainty, the lines formed by the edge of the permanent vegetation along the boundary watercourse shall be considered the shorelines.

Article 6.

(1) In the event of relatively minor natural changes in boundary watercourses, the frontier shall always follow the median line of the boundary watercourse.

(2) In the event of relatively major natural changes and of artificial changes, the frontier shall run as it did before the occurrence of the change, until the Contracting States agree on another course for the frontier.

(3) In the event of a change in the position of the moving boundary at points where it joins the stable boundary, the juncture shall be determined by a ruling of the permanent boundary commission of State A and B.

Article 7.

(1) In the X River boundary watercourse, the frontier shall be determined by the median line of the fairway and shall be a moving boundary. It shall follow the natural changes of the median line of the fairway.

(2) The term “median line of the fairway” means a smooth, continuous line equidistant from the two lines bounding the fairway.

(3) The term “fairway” means the part of the river bed that is deepest, used for navigation, bounded by two lines running in an interrelated manner and surveyed by means of cross-sections.

Article 8.

(1) As far as possible, the Contracting Parties shall maintain the position of the bodies of water through which the frontier runs, unless essential water management interests and environmental considerations require otherwise. The provision of article 5, paragraph 1, shall remain unaffected.

(2) Notwithstanding the provision of paragraph 1, the common use of these waters by the two Contracting States shall not be affected.

PART II.**SURVEYING AND MARKING OF THE FRONTIER****PART III.****PROTECTION OF BOUNDARY MARKS AND MAINTENANCE OF THEIR VISIBILITY**

[depending on whether or not the delimitation treaty builds upon a (partial) pre-existing demarcation, clauses contained in Part II and III [see Annex II.4] may either be part of a delimitation treaty already or be included in a subsequent demarcation treaty only]

PART IV.**BOUNDARY COMMISSION**

[respective provisions may also be made part of a delimitation treaty: see Annex II.4]

PART V.
FINAL PROVISIONS

Article 25.

- (1)** Disputes over the interpretation or implementation of this Treaty shall be resolved by the Governments of the two Contracting States.
- (2)** Any dispute that cannot be settled in the above manner may be submitted to an arbitral tribunal at the request of either Contracting State.
- (3)**[Details on the composition and decision-making of an arbitral tribunal]

Article 26.

- (1)** This Treaty is subject to ratification. The instruments of ratification shall be exchanged at ... as soon as possible.
- (2)** This Treaty shall enter into force on the first day of the third calendar month following the exchange of the instruments of ratification.

Article 27.

- (1)** This Treaty is concluded for an indefinite period. Parts I and V may not be denounced. The other provisions of this Treaty may be denounced in writing after expiry of a period of ten years from the date of its entry into force. Denunciation shall take effect two years from the date of receipt of notice.
- (2)** The annexes referred to in article 2 shall form integral parts of this Treaty.

Article 28.

On the date of entry into force of this Treaty, the following shall cease to have effect:

- (a)** [list of all prior treaties abrogated by the present legal instrument]

In witness whereof the plenipotentiaries of the two States have signed this Treaty and affixed their seals thereto.

Done at ... on ... in two originals, each in the M and N languages, both texts being equally authentic.

For State A: [signature]

For State B: [signature]

ANNEXES (Boundary documentation):

- ▶ Description of the state boundary (in tabular form);
- ▶ Overview map(s), scales 1:25,000 – 1:250,000;
- ▶ Boundary maps(s) (classical or ortho-photo maps), scales 1:1,000 – 1:10,000;
- ▶ Catalogue of coordinates (in one common or in two national reference systems).

N.B.: Information regarding registration of treaties at United Nations

Access. At present, approximately 158,000 treaties have been registered with the United Nations. Published in hard copy (United Nations Treaty Series (UNTS): at present [2012] approximately 2,300 volumes), treaties are also accessible online (UNTS Database: <http://treaties.un.org>). Each treaty is tagged with a Registration Number and published (in the order of registration) in the original language along with an English and French translation – unfortunately with a considerable time lag. Treaties registered between 5 July 1920 and 3 October 1944 have been published in 205 hard copy volumes (League of Nations Treaty Series (LNTS)) and are also accessible online (LNTS Database: <http://treaties.un.org>).

Technical guidelines: The Treaty Section of the United Nations Secretariat has issued two Technical Guidelines on Submission of Treaty for Publication (<http://treaties.un.org/doc/source/guidelines.pdf>):

- ▶ Guidelines on copying bounded treaties and related documents to be submitted for publication with the UN Secretariat when electronic copies do not exist.
- ▶ Guidelines for electronic submissions typed and saved in Word format.

Checklist. According to the UN Secretariat's Treaty Section, the following are the requirements for submission of treaties and international agreements for registration and publication in accordance with Art. 102 of the UN-Charter (Treaty Handbook, 54):

DOCUMENTATION/ INFORMATION TO BE PROVIDED	FORMAT/ TYPE OF INFORMATION
1. Treaty/Agreement	<ul style="list-style-type: none"> ▶ ONE certified true and complete copy of all authentic text(s), and ▶ TWO additional copies or ONE electronic copy (on diskette)
2. All attachments (annexes, minutes, procès-verbaux, etc.)	Same as (1) above
3. Text of reservations, declarations, objections	Same as (1) above
4. Translations of the Agreement and all attachments into English and/or French (if available)	One paper copy and one electronic copy, if available, where necessary
5. Title of Treaty/Agreement	If not printed as part of the text (e.g., for exchange of notes)
6. Names of signatories	If not appearing in typed form as part of signature block
7. Date of signature	If not clear from the text
8. Place of signature	If not clear from the text
9. Date of entry into force	In accordance with entry into force provisions
10. Method of entry into force	<p>Signature, ratification, approval, accession, etc., including:</p> <ul style="list-style-type: none"> ▶ In the case of a bilateral agreement, date and place of exchange of the instruments of ratification or notification; or ▶ In the case of a multilateral agreement, date and nature of the instruments deposited by each Contracting Party with the Depositary

The Treaty Section of the Office of Legal Affairs responds to questions and offers

assistance to all issues related to the registration and publication of treaties.

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TreatyRegistration@un.org
Web site: <http://untreaty.un.org>

Annex VIII

Optional provisions for a boundary-delimitation treaty

PART II.

SURVEYING AND MARKING OF THE FRONTIER

Article 9.

The Contracting States undertake to ensure, by surveying and marking the frontier, that the course of the frontier at all times remains clearly discernible and geodetically defined. They undertake to keep the boundary marks in good order pursuant to this Treaty and, if necessary, to replace them, and to update the boundary documentation.

Article 10.

(1) Each Contracting Party shall make available at its own expense the surveyors and auxiliary survey personnel necessary for surveying and marking the frontier.

(2) Further personnel and the required materials, vehicles and equipment (such as machinery, tools and surveying instruments) shall be provided by each Contracting Party at its own expense, as follows:

- ▶ by State A in sector 1, 2, 3 of the frontier;
- ▶ by State B in sector 4, 5, 6 of the frontier.

(3) Where necessary on grounds of economic efficiency and expediency, derogations from the provision of paragraph 2 by common consent shall be possible. In such a case, a balance shall be sought between the contributions of the two parties.

Article 11.

Where a boundary mark is damaged or destroyed, the Contracting State responsible for it under articles 8 and 9 shall bear the total costs of repair or replacement. All claims against the author of such damage shall pass to that Contracting Party.

Article 12.

(1) The Contracting States shall jointly inspect the boundary marks every ten years and remedy any deficiencies that are detected.

(2) The first joint inspection of the boundary marks shall begin no later than five years after the entry into force of this Treaty.

(3) Boundary watercourses shall be surveyed on every second joint inspection of the boundary marks.

Article 13.

(1) When necessary in order to ensure that the frontier is clearly discernible, the Contracting States shall take the necessary measures even apart from the periodic joint inspections of boundary marks.

(2) If a Contracting State asserts that a boundary mark has been displaced, the Contracting States shall, even apart from the periodic joint inspections, check the position of that mark and, if necessary, move it to the right place.

(3) If the position of a boundary watercourse has changed significantly, a Contracting State may demand that the course of the frontier in that area shall be determined and recorded in the corresponding boundary documents.

Article 14.

(1) The owners and other parties entitled to the use of land or surface or underground buildings or installations situated at or near the frontier shall be required to permit the work and measures necessary for marking and surveying, and in particular the setting up or affixing of boundary or survey marks. To carry out their duties, the persons entrusted with the tasks provided for in articles 8, 11 and 12 shall have the right to walk or drive onto properties and enter structures. Entry into residences and similarly protected premises shall be permitted only with the consent of the parties entitled to their use. The parties concerned shall be informed of the commencement of work in a timely manner.

(2) Marking and surveying shall be undertaken with the greatest possible regard for public and private interests.

(3) Where damages arise from such work and such measures, the injured party shall be entitled to claim compensation from the Contracting State in whose territory the land, buildings or installations are situated. Claims for compensation that are brought by owners and other parties entitled to the use of a property as referred to in paragraph **(1)** shall be governed by the law of the Contracting State in whose territory the land, buildings or installations are situated. The injured party may not bring any claim for damages against the other Contracting State.

PART III.**PROTECTION OF BOUNDARY MARKS AND MAINTENANCE OF THEIR VISIBILITY****Article 15.**

The Contracting States shall take appropriate measures to protect the boundary and survey marks and the other structures serving to identify the frontier from damage, destruction, unauthorised displacement or improper use.

Article 16.

(1) The Contracting States shall ensure that a strip 1-metre wide on either side of the land portion of the frontier and a circle with a radius of 1 metre around the boundary marks indirectly indicating the course of the frontier are kept free of vegetation obstructing visibility.

(2) The owners and other parties entitled to the use of the land shall be required to permit the work and measures referred to in paragraph 1. In other respects, article 14 shall apply as appropriate.

PART IV.**BOUNDARY COMMISSION****Article 17.**

(1) A permanent A-B boundary commission (hereinafter called “the Commission”) is hereby established by the Contracting States to be responsible for surveying and marking the frontier, updating the boundary documentation, protecting the boundary marks and preserving their visibility.

(2) The Commission shall be composed of a delegation from State A and a delegation from State B, each comprising no more than ... members. Each Contracting State shall appoint the members of its delegation and substitute members in case of need. A delegation may employ the services of experts and auxiliary staff as required.

(3) Each Contracting Party shall designate one of its appointed members as chairperson and another as deputy chairperson of its delegation. The chairpersons and their deputies shall be authorized to communicate with each other directly.

(4) Each Contracting Party shall bear the costs of its delegation, including the costs of any experts and auxiliary staff whose services it employs. Unless otherwise agreed, other costs incurred in connection with the Commission’s activities shall be shared equally by the Contracting States.

Article 18.

(1) In particular, the Commission shall be responsible for the following:

(a) Determining how the work of marking and surveying the frontier and maintaining its marking shall be organised and what methods shall be used;

(b) Carrying out the necessary surveys and maintaining the network of control stations necessary for the geodetic definition of the frontier;

(c) Ascertaining the kind and extent of changes to boundary watercourses, determining alterations to the character of the frontier and taking the measures necessitated thereby;

(d) Making changes to the marking of the frontier when boundary roads, boundary paths or boundary ditches are created or removed;

(e) Giving its opinion on the course of the frontier in connection with water management measures regarding boundary watercourses;

(f) Giving its opinion on construction and other engineering work undertaken in the immediate vicinity of the frontier;

(g) Determining the content and form of updates to the boundary documentation. The Commission shall draw up the work plans necessary for carrying out these tasks.

(2) The Commission shall prepare the boundary documentation in accordance with article 2, paragraph 2. In that connection, a balance between the contributions of the two parties shall be sought.

(3) The Commission shall issue rules of procedure for its joint activities, guidelines for surveying and maintaining the marking of the frontier and a directive on preparing and updating the boundary documentation.

(4) The Commission may not change the course of the frontier.

(5) The Commission may submit to the Governments of the Contracting States suggestions for changes to the course of the frontier.

Article 19.

(1) The decisions of the Commission shall require the agreement of the chairpersons of both delegations. The decisions shall be an integral part of the protocols of the meetings held or frontier inspections conducted by the Commission. The protocols shall become legally binding as soon as the chairpersons of the two delegations notify each other in writing that the respective domestic requirements have been fulfilled. Such notifications shall be given as soon as possible and at any rate no later than by the next meeting of the Commission.

(2) If the chairpersons of the two delegations are unable to reach agreement, further action by the Commission shall proceed through the diplomatic channel. The Contracting States shall endeavour to arrive at an agreed settlement of the disputed issues.

Article 20.

(1) To fulfil its tasks, the Commission shall set up joint technical groups and determine their number and composition according to the scope and kind of the work to be carried out.

(2) In carrying out their tasks, the heads of the joint technical groups shall abide by the protocols drawn up by the Commission.

(3) When the Commission decides that the frontier marking shall be supplemented, altered or replaced or makes a determination on the basis of survey results, a record shall be drafted in duplicate in the A and B languages. Technical supporting documents shall be prepared if necessary.

(4) The records and technical documents of the joint technical groups shall require approval by the Commission.

(5) After the completion of each periodic inspection, the Commission shall sum up the results of the work accomplished in accordance with paragraph 3.

(6) Article 9, paragraphs 2 and 3, shall apply as appropriate to the production and reproduction of technical documents, to updates to the boundary archive, and to the task provided for in paragraph 5.

Article 21.

(1) The Commission shall hold meetings or conduct frontier inspections when it so decides or when either Contracting State so requests through the diplomatic channel.

(2) Unless otherwise agreed, the Commission shall hold meetings and conduct frontier inspections alternately in the territory of each Contracting State.

Article 22.

(1) The Commission's meetings and frontier inspections shall be chaired by the chairperson of the delegation of the Contracting State in whose territory they take place. Proceedings shall be conducted in the A and B languages.

(2) A protocol of each meeting and frontier inspection shall be drawn up by the Commission in duplicate in the A and B languages and signed by the chairpersons of both delegations.

Article 23.

(1) The members of the Commission and of the joint technical groups and the experts and auxiliary staff whose services are employed by those bodies may access the frontier freely and cross it at any time without restriction, if that is necessary for carrying out their tasks. They shall be required to identify themselves on request by a duty pass with photograph or by a valid passport or identity card and a written official order of the Commission in the A and B and language.

(2) When conducting their activities in the territory of the other Contracting State, the persons referred to in articles 10, 17 and 20, if they belong to uniformed and particularly to military units, may wear the uniform and use the vehicles of their unit but shall carry no weapons.

Article 24.

(1) Materials that are exported from the customs territory of one Contracting State to the customs territory of the other and used for the performance of the tasks provided for in this Treaty shall be exempt from import and export charges. The materials not used shall be re-exported to the customs territory of the Contracting State from which they were imported.

(2) For the purposes of this Treaty, import and export charges mean import and export duties and all other taxes and fees levied on merchandise imported or exported.

(3) On condition that they shall be re-exported, vehicles, tools, equipment, instruments, apparatus and machinery imported from the customs territory of one Contracting State to the customs territory of the other and used for the performance of the tasks provided for in this Treaty shall be exempt from import and export charges and from security deposits. Such articles shall be re-exported no later than one month after the termination of work to the customs territory from which they were imported.

(4) When used for the performance of the tasks provided for in this Treaty, the articles referred to in paragraphs 1 and 3 shall not be subject to any import and export prohibitions or limitations.

(5) The Contracting States shall provide each other, in any way permissible under their domestic law, with facilitated customs procedures for importing and exporting the articles required for the performance of the tasks provided for in this Treaty.

Annex IX

Political support for the demarcation process

Rupiah B. Banda, President of Zambia

**(Speech for the Opening of the 44th Session of the 10th National Assembly -
Sept. 18, 2009)**

"Government will continue working with neighboring countries to ensure that all our borders are physically marked and re-affirmed. This is important as it prevents unnecessary boundary disputes ..."

Cameroon – Nigeria

(Greentree Agreement – June 12, 2006)

Article 1: "... Cameroon and Nigeria recognise the land and maritime boundary between the two countries as delineated by the Court and commit themselves to continuing the process of implementation already begun."

UN Secretary General Cameroon – Nigeria

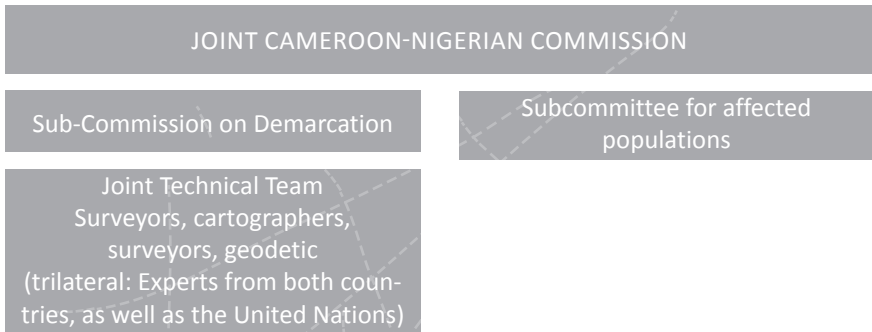
(SG/SM/11745 – August, 14, 2008)

"... the case of the Bakassi peninsula has proven the viability of a peaceful and legal settlement of border disputes, when it is done with the full support of the international community and in a spirit of mutual respect, good neighbourliness and cooperation. Today, I wish to pay tribute to the foresight and political will demonstrated by the Governments and peoples of the Republic of Cameroon and the Federal Republic of Nigeria. It is, in particular, their patience and perseverance that have made this remarkable experiment, and today's ceremony, possible. Furthermore, the success of their initiative has provided the world with a model for the peaceful resolution of sensitive disputes. [...] As the two countries continue to work together to finalise the demarcation of their land boundary and foster cross-border cooperation at different levels, they will benefit from the continued engagement and support of the United Nations."

Annex X

Example of joint boundary commission

a) Example from African state practice:



For Joint Commissions on all levels agreement must be reached on

- ▶ Terms of References;
- ▶ Technical Procedures and Technical Specifications;
- ▶ Work Plan and Budget;
- ▶ Funding.

b) Example from Mozambique, Zambia and Malawi:

Joint Commission of Government Officials	Joint Technical (Steering) Commission	Joint Technical (Survey) Team
<ul style="list-style-type: none"> • Provide policy direction on the boundary reaffirmation exercise. • Consider recommendations and provide final approval of any proposed joint work plans and budgets. • Consider the final draft treaties and make recommendations to both governments for possible adoption. • Keep the Joint Permanent Commission on Defence and Security informed of its recommendations and decisions. 	<ul style="list-style-type: none"> • Provide technical oversight to the Joint Survey Team. • Consider recommendations from the Joint Survey Team and make decisions on technical issues including work plan and budgets. • Identify unresolved issues and make recommendations for consideration of the Joint Committee of Government Officials. • Mobilise resources for the implementation of the boundary reaffirmation exercise. and • Prepare draft treaties for the boundary reaffirmation. 	<ul style="list-style-type: none"> • Survey all existing boundary beacons and monuments to confirm their true positions. • Replace all missing, destroyed or displaced beacons and any boundary marks. • Determine and physically mark the watershed line. • Determine and reference the boundary line along the water bodies considering in mind the changes in their course. • Recommend the need for intermediate beacons where necessary. • Detect and clear all zones of unexploded ordnance along the common boundary. • Determine the exact positions of villages, infrastructures and other forms of development along the common boundary. • Communicate, collaborate and coordinate activities with relevant authorities and other intervening bodies with respect to the developments in the vicinity of the common boundary. • Compile and submit progress reports on work done based on the Joint Work Plan and Budget to the respective National Technical Committees on the common boundary and final technical report of observations findings results and recommendations from its activities. • Implement decisions recommended by the Joint Technical Committee. • Develop a detailed Joint Project Proposal (work plan, list of equipment, human, technical, financial resources and time frame). • Establish, clear and maintain the common boundary line.

Annex XI

Direct labour and material costs (building boundary pillars)

COST OF DEMARCATION OF BOUNDARIES OF MOZAMBIQUE

- construction of 5 beacons per day (2 type A - big, and 3 type B – small):
- use 23 cement bags per day (7 bags for beacon A and 3 bags for - B)
- work 6 days per week (Monday to Saturday)
- work 4 weeks per month.
- ± 270 cement bags per month by country (23 bags x 6 days x 4 weeks = 552 bags by month)

Calculation of irons for construction of 5 beacons per day (2 A and 3 B):

- beacon A = 2 irons of 6 mm and 1 iron of 10 mm
- beacon B = 1 iron of 6 mm and 1 iron of 10 mm
- beacons A and B = 1 iron of 12 mm/day:
 - beacon A = 2 beacons per day need 3 m of iron 12 mm (1,5 m per beacon)
 - beacon B = 3 beacons per day need 3 m of iron 12 mm (1 m per beacon)

Annex XII

Example of third-party funding

Example I: In order to enable Burkina Faso and Mali to implement the judgment of the International Court of Justice both States have jointly asked for support from international donors and have received substantial aid from the Swiss Agency for Development and Cooperation and the German Agency for International (then: Technical) Cooperation. Aid money covered expenses for the acquisition of modern technical equipment and motor vehicles as well as for the formation of four engineers, two from each “Institut Géographique” of the two States involved. A certain amount of working capital to guarantee the progress of the field work was also part of the grant.

Example II: A rather unique, complex and highly internationalised financing system was established for the purpose of the demarcation of the Cameroon/Nigeria boundary:

- ▶ The United Nations support team is financed from the regular UN budget;
- ▶ Creation of a United Nations Trust Fund for the financing of the demarcation process whose major contributors apart from Cameroon and Nigeria, who provided initial funding of three million dollars in 2004, include the European Union, the United Kingdom and others.

Annex XIII

Sensitisation of border communities

a) Message issued by the Cameroon – Nigeria Mixed Commission

MESSAGE FOR THE SENSITISATION OF THE BORDER COMMUNITIES IN THE BOUNDARY AREAS DURING THE DEMARCATION EXERCISE

- 1 The Cameroon-Nigeria boundary case was decided by the ICJ judgment on 10 October 2002. The Heads of State of Cameroon and Nigeria together with the United Nations Secretary General decided to set up the Cameroon Nigeria Mixed Commission (CNMC) to peacefully implement the judgment in the spirit of African brotherhood. Since then, the experts of Cameroon, Nigeria and the United Nations have undertaken several field missions along the border areas to determine the boundary line as decided by the ICJ.
- 2 Now that the boundary is known and accepted by both countries, a Contractor has been appointed to construct pillars along the boundary. These pillars are meant to define the areas of jurisdiction of each state and not to separate the population who should continue to live in peace.
- 3 The two countries decided to build pillars along the boundary line. This work has been awarded to a contractor who will begin his field work on 26 October 2009 in Dambore village.
- 4 The contractor's personnel will be assisted by representatives of Cameroon and Nigeria to ensure that everything goes well. On your part, you should assist the contractor as much as possible to ensure that it does its work well by allowing it to work freely. If you have any concerns about the conduct of the work, you must tell your village head who will report it to the appropriate authorities to look into it. Do not take the law into your own hands.
- 5 We must remind you that the demarcation of the boundary is not intended to divide you. The pillars are simply meant to enable you to know when you are in Cameroon and when you are in Nigeria.
- 6 The two Heads of State have decided that each of you has the right to remain where you are while keeping your nationality, or remain where you are while changing your nationality, or return to your country and resettle.
- 7 Cameroon and Nigeria are two brotherly countries. Cameroonians and Nigerians are brotherly peoples who were indeed separated by colonial boundaries, but who remain brothers in spite of everything.

b) Burkina Faso/Benin

The Kourou-Koalou area is the most contested spot on the Burkina Faso/Benin border. The unsettled territorial status led to repeated tensions prompting both States to agree to submit their border dispute to the ICJ for binding decision. In expectation of the Court's verdict and at the initiative and with the constant support of the highest political level of both States (Presidents), a strategy of (provisional) neutralisation and joint administration of the area was developed and successfully implemented. Key elements of this strategy included

- ▶ identification of the contested zone;
- ▶ sensitisation of the population in border communities to facilitate peaceful and harmonious cohabitation (à la cohabitation pacifique et harmonieuse);
- ▶ creation of an institutional framework;
- ▶ joint realisation of socio-economic projects.

At the joint meeting on May 19, 2009, the responsible Ministers agreed on the following agenda:

Ministerial Working Meeting

BURKINA FASO/BENIN

Pama, 19th May 2009

Joint communique

- a Establish a ministerial framework for dialogue on the management of the Kourou/Koalou area. It shall include Ministers in charge of boundary issues, security and land management, as well as a senior executive with each of them.
- b Establish a joint committee for the common management of the Kourou/ Koalou area. It shall be in charge of the facilitation, sensitisation and support of the local populations.
- c Establish a joint fund for the management of the area.
- d Avoid any other unilateral initiative than housing in the area. In case of rule violation, the matter shall immediately be referred to the committee.
- e Infrastructure projects underway shall be transmitted to COMGEC-K management (two schools and one trail).
- f End unilateral patrols and, from that day onwards, organise joint patrols from both countries.

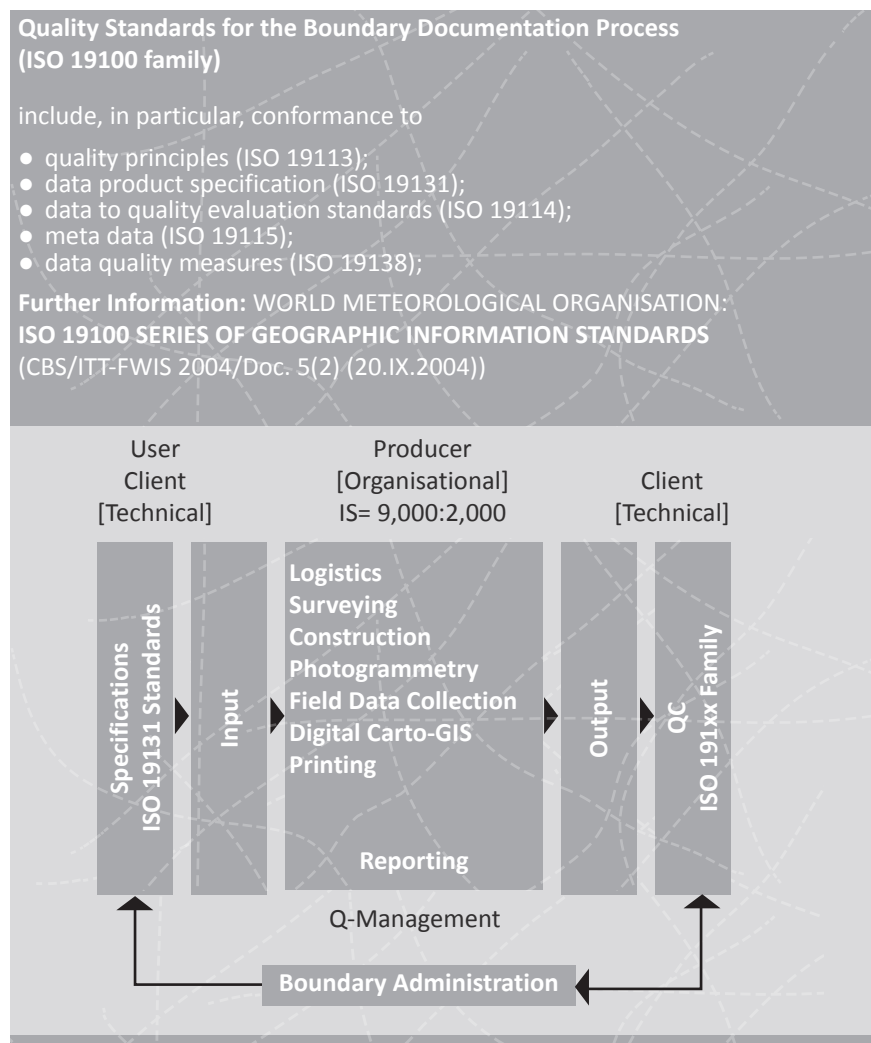
As an immediate and rather important, albeit only symbolic measure, the Ministers further agreed to remove all sovereignty symbols on both sides. Notwithstanding a number of political and financial obstacles, the Joint Committee (Comité mixte de gestion concertée de la zone Kourou/Koalou dénommé COMGEC-K – see Communiqué lit. c) has in the meantime successfully launched a number of joint projects in order to improve the infrastructure for the benefit of the local population.

c) Mozambique, Zambia, and Malawi

As underlined by the President of Zambia in his speech of September 18, 2009 before the National Assembly of his country, sensitisation of border communities is high on the political agenda and constitutes an integral part of all demarcation efforts: “Sensitisation programmes for communities living along the Zambia-Mozambique border in readiness for re-affirmation of this border have also been carried out. “The same approach is followed in neighbouring States. In preparation for demarcation work and in pursuance of a comprehensive sensitisation strategy, a Joint Sensitisation Committee was formed. Composed of members with different professional backgrounds (Environment, Wildlife, Immigration, Police, Defence, Land, Mining, etc.), the Committee, after having identified relevant target groups (traditional rulers, church leaders, local government administrators and the local population itself), prepared sensitisation messages that were disseminated in border communities. Core messages include the assurance that the border is merely for Government administration purposes and will not prevent people from living the way they have always lived, including in particular a (semi-)nomadic lifestyle. Crucial factors contributing to the success of the campaign were the team spirit within the Committee, the positive participation of traditional rulers, and the political support of both Governments.

Annex XIV

ISO 19100 family

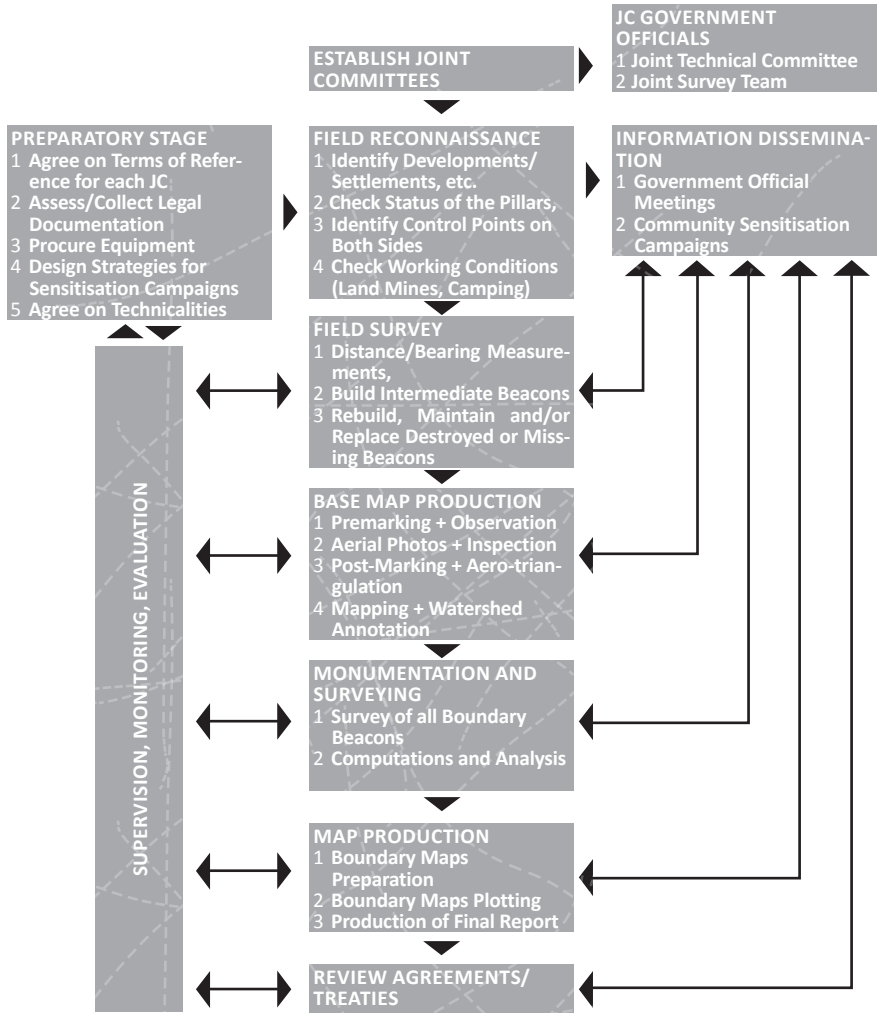


Connection between ISO 9000 organisational and ISO 19100 technical specifications

[according to M Al Sayel, P Lohmann, C Heipke: International Boundary Making – Three Case Studies (Paper presented at June 2009 Hannover Workshop of the International Society for Photogrammetry and Remote Sensing (ISPRS))]

Annex XV

Flow diagramme of activities for boundary demarcation – Mozambique



Annex XVI

Forms used for the demarcation of the Cameroon/ Nigeria boundary (pillars and river banks)

PAGE 1/2

IDENTIFICATION DE L'EMPLACEMENT DES BORNES IDENTIFICATION OF PILLAR SITES

Cameroon-Nigeria Mixed Commission/Commission Mixte Cameroon-Nigeria
Sub-Commission on Demarcation/Sous-commission de la Démarcation
Joint Technical Team/Equipe technique mixte

Team/Equipe: _____
Date: _____
Location/Lieu: _____

Pillar Site ID/ Identification emplacement de borne	Time/ Temps	Equipment/ Equipement
	H M	TYPE No

LATITUDE (N)	LONGITUDE (E)	HEIGHT/ELEVATION (m)

UTM Zone/ Zone UTM	UTM (EASTING/VERS L'EST)	UTM (NORTHING/VERS LE NORD)

MIDDLE/MILIEU (m)	LENGTH/ LONGUEUR (m)

COMMENTS/OBSERVATIONS	SKETCH/CROQUIS

Team Leader – Republic of Cameroon
Chef d'équipe – République du Cameroun _____

Team Leader – Federal Republic of Nigeria
Chef d'équipe – République Fédérale du Nigeria _____

Representative – United Nations
Représentant – Nations Unies _____

PAGE 2

Location Sketch
Croquis de location

Detailed Sketch
Croquis détaillé

Team Leader – Republic of Cameroon
Chef d'équipe – République du Cameroun _____

Team Leader – Federal Republic of Nigeria
Chef d'équipe – République Fédérale du Nigeria _____

Representative – United Nations
Représentant – Nations Unies _____

PAGE 1/2

IDENTIFICATION DE L'EMPLACEMENT DES RIVES DE LA RIVIERE IDENTIFICATION OF THE LOCATION OF RIVER BANKS

Cameroon-Nigeria Mixed Commission/Commission Mixte Cameroon-Nigeria
Sub-Commission on Demarcation/Sous-commission de la Démarcation
Joint Technical Team/Equipe technique mixte

Team/Equipe: _____
Date: _____
Location/Lieu: _____

UTM Zone/ Zone UTM	Time/ Temps	Equipment/ Equipement
	H M	TYPE No

LEFT BANK / RIVE GAUCHE

Point ID/ Point	UTM (EASTING/VERS L'EST)	UTM (NORTHING/VERS LE NORD)
EDGE OF WATER/BORD DE L'EAU (m)		DEPTH/PROFONDEUR (Approx. m)
COMMENTS/OBSERVATIONS		

RIGHT BANK / RIVE DROITE

Point ID/ Point	UTM (EASTING/VERS L'EST)	UTM (NORTHING/VERS LE NORD)
EDGE OF WATER/BORD DE L'EAU (m)		DEPTH/PROFONDEUR (Approx. m)
COMMENTS/OBSERVATIONS		

Team Leader – Republic of Cameroon
Chef d'équipe – République du Cameroun _____

Team Leader – Federal Republic of Nigeria
Chef d'équipe – République Fédérale du Nigeria _____

Representative – United Nations
Représentant – Nations Unies _____

PAGE 2/2

IDENTIFICATION DE L'EMPLACEMENT DES RIVES DE LA RIVIERE IDENTIFICATION OF THE LOCATION OF RIVER BANKS

Sketch/Croquis

COMMENTS/OBSERVATIONS

Team Leader – Republic of Cameroon
Chef d'équipe – République du Cameroun _____

Team Leader – Federal Republic of Nigeria
Chef d'équipe – République Fédérale du Nigeria _____

Representative – United Nations
Représentant – Nations Unies _____

Annex XVII

Boundary Convention – Algeria/Mali

Convention concerning the demarcation of the State frontier (with annexes) 1983 (UNTS 1373, 223)

Article 2. The common frontier of the two States shall be demarcated by the erection of boundary beacons in the field along the frontier line described in Article 1 above.

Article 3. The demarcation operations shall be supervised by a Mixed Demarcation Commission. A Mixed Technical Group, to be appointed by this Commission, shall conduct the demarcation operations.

Article 4. When the operations are concluded, the Mixed Demarcation Commission shall draw up the following documents:

- 1 The record cards of the boundary beacons with their geographic co-ordinates.
- 2 The copies of the 1:25,000 scale field map showing the frontier line in sectors 2, 3, 4 and 5 as referred to in article 1 above.
- 3 The 1:1,000,000 scale maps showing the boundary beacons and the frontier line.
- 4 The list of co-ordinates of the boundary beacons indicating the frontier between the two States.
- 5 A record of the conclusion of the demarcation operations.

Article 5. The annexes referred to in article 1 and the documents mentioned in Article 4 above, initialled and signed by the Co-Chairmen of the Mixed Demarcation Commission, shall form an integral part of this Convention.

Article 6. The file of all preparatory operations for the demarcation of the two States' common frontier shall be deposited, duly stamped and initialled, with the cartographic authority of each of the two countries.

Article 7. The Contracting Parties shall, as soon as possible, draw up maps on the scales 1:200,000 and 1:1,000,000 indicating the location of the boundary beacons and the course of the frontier. The documents and other cartographic information annexed to this Convention shall henceforth serve as a reference for any activity involving the frontier line.

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This guide delivers a detailed description of the different stages required for the complex process of delimitation and demarcation of boundaries. It presents relevant experiences accumulated in the past by various African States. In particular, the guide illustrates the phases of consultation and negotiation, followed by the drafting and entry into force of a boundary treaty, the process of physical boundary demarcation, and finally the maintenance of the physical boundary. Essential for the success of this undertaking is the local population's identification with and acceptance of the demarcated boundary.

This guide aims to support the African Union Member States in their endeavour to delimitate, demarcate, and reaffirm their international boundaries by 2017 at the latest.

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